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ORAL USE OF CORTISONE IN CHRONIC ADRENAL CORTICAL INSUFFICIENCY

STUDY OF SIX CASES

Marvin S. Levy, M.D., Beverly Hills, Calif.

The recent availability of cortisone has made possible great improvement in the treatment of chronic adrenal cortical insufficiency. The effect of its parenteral administration in patients with Addison's disease has been well documented,[1] but there is less information on the adequacy of oral therapy. Further data on the latter method of treatment are desirable in regard to both clinical and metabolic responses. Oral therapy, if proved effective, would permit the patient to adjust his dose easily, in accordance with the severity of symptoms, and, at the same time, would obviate the inconvenience of injections.

The six patients whose case histories provide the material for this report were studied with special reference to their responses to oral administration of cortisone. Four patients had uncomplicated Addison's disease; one had Addison's disease and diabetes mellitus; and another had symptoms of hypoadrenocorticism, secondary to removal of a chromophobe adenoma of the pituitary. The first four patients were followed in the metabolic wards of the hospital, and the other two were from private practice.

Gains in strength and weight and a sense of well-being were considered the most important evidence of a favorable clinical response. Metabolic observations included (1) alteration in carbohydrate metabolism, as shown by changes in glucose tolerance curves,[2] (2) changes in the urinary excretion of 17-ketosteroids (modification of Pincus' method [3]) and 11-oxysteroids,[4] (3) changes in serum electrolytes, and (4) changes in response to ingestion of water, as demonstrated by Robinson-Power-Kepler water test.[5]

Treatment with desoxycorticosterone acetate, started previous to this study, was continued in all cases. For the patient with diabetes mellitus and Addison's disease and for the patient with secondary adrenal cortical insufficiency, oral use of cortisone was substituted for daily injections of 0.5 to 1 cc. of lipo-adrenal cortex.

REPORT OF CASES

CASE 1.—A. B., a 29-year-old white man, was well until June, 1945, when, while serving in the European theater of war, he experienced progressive weakness, weight loss, and hypotension. A diagnosis of Addison's disease was made. Treatment consisted of desoxycorticosterone acetate implants, 500 to 850 mg. at 15 to 18 month intervals. After onset of the disease, progressive pigmentation of the skin and occasional spells of weakness and dizziness occurred. When the implants were exhausted, the patient became anorexic, weak, and drowsy and had an elevated serum potassium level, depressed serum sodium and chloride levels, hypotension, and hypoglycemia. He responded well to implantation of desoxycorticosterone acetate and was able to work as an accountant for three to four hours daily without excessive fatigue.

Examination in February, 1951, revealed an alert, well-nourished, well-developed man with deeply pigmented skin. Brownish pigmentation was present on mucous membranes, in skin creases, at points of contact, and in scars at the site of desoxycorticosterone implants. The skin of his extremities was cold and clammy. Blood pressure was 100/60. Body and axillary hair was

From the Metabolic Section, Medical Service, Wadsworth Hospital, Veterans Administration Center, and the Department of Medicine, University of California at Los Angeles.

Reviewed by the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions of the author are the result of his own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

1. (*a*) Sprague, R. G., and others: Observations on the Physiologic Effects of Cortisone and ACTH in Man, Arch. Int. Med. **85**: 199 (Feb.) 1950. (*b*) Sprague, R. G.; Kepler, E. J.; Keating, F. R., Jr., and Power, M. H.: Coexisting Addison's Disease and Diabetes Mellitus: Comparative Effects of Compound E (17-Hydroxy-11-Dehydrocorticosterone) and Allied Substances in Three Cases, J. Clin. Investigation **26**: 1198 (Nov.) 1947. (*c*) Perera, G. A.; Pines, K. L.; Hamilton, H. B., and Vislocky, K.: Clinical and Metabolic Study of 11-Dehydro-17-Hydroxy-Corticosterone Acetate (Kendall Compound E) in Hypertension, Addison's Disease and Diabetes Mellitus, Am. J. Med. **7**:56 (July) 1949. (*d*) Ingle, D. J.: Biologic Properties of Cortisone: A Review, J. Clin. Endocrinol. **10**: 1312 (Oct.) 1950. (*e*) Thorn, G. W., and others: Clinical and Metabolic Changes in Addison's Disease Following the Administration of Compound E Acetate (11-Dehydro, 17-Hydroxycorticosterone Acetate), Tr. A. Am. Physicians **62**: 233, 1949. (*f*) Sprague, R. G.; Power, M. H.; Mason, H. L., and Cluxton, H. E.: Metabolic Effects of Synthetic Compound E (17-Hydroxy-11-Dehydrocorticosterone) in Two Patients with Addison's Disease and One with Coexisting Addison's Disease and Diabetes Mellitus, abstracted, J. Clin. Investigation **28**: 812 (July) 1949.

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sparse, but pubic hair was of normal amount and distribution. The gonads were normal. Except for pigmentation of the skin, results of examination were normal.

In March, 1951, oral treatment with 12.5 mg. of cortisone twice daily was started. There was no demonstrable effect for five days; then, the patient began to notice a state of increasing well-being and strength. After one week, he preferred to remain active all day and stated that he could not recall when he had felt so strong. Oral cortisone therapy was continued, with a single daily dose of 25 mg., with maintenance of improvement. In May, 1951, he was able to obtain and hold a position requiring eight hours' accounting work daily, although 16 months had elapsed since his last implant of six 125 mg. pellets of desoxycorticosterone acetate.

The following laboratory results were obtained immediately preceding cortisone therapy. A chest roentgenogram for tuberculosis was normal, as was a roentgenogram of the adrenal areas for calcification. The glucose tolerance curve, after ingestion of 100 gm. of glucose, was: fasting, 70 mg. per 100 cc.; after one-half hour, 170 mg.; after one hour, 122 mg.; after two hours, 78 mg.; and, after three hours, 66 mg. per 100 cc. Serum sodium was 139 mEq per liter; carbon dioxide was 26 mEq per liter; the blood urea nitrogen level was 14 mg. per 100 cc.; urinary 17-ketosteroids were 5.1 mg. in 24 hours. In the water test, the night volume of urine was 300 cc., and the largest single day volume was 90 cc.; the urea chloride index was 20.

The following laboratory results were obtained after two months of cortisone therapy, 25 mg. once daily. The glucose tolerance curve after ingestion of 100 gm. of glucose was: fasting, 70 mg. per 100 cc.; after one-half hour, 82 mg.; after one hour, 66 mg.; after two hours, 66 mg. per 100 cc.; and, after three hours, 30 mg. per 100 cc. The urinary 17-ketosteroids were 2.6 mg. in 24 hours; 11-oxysteroids were 1.97 mg. in 24 hours; blood chemistry determinations remained essentially normal. In the water test, the night volume of urine was 250 cc. and the largest single day volume was 75 cc.; the urea chloride index was 20.

CASE 2.—L. P., a 28-year-old white man, was well until November, 1949, when he began to notice numbness, coldness, and a pallor of his hands and feet and intermittent periods of nausea, vomiting, and diarrhea, lasting two to three days. His strength decreased rapidly, and he had periods of vertigo and one short period of unconsciousness, with spontaneous recovery. By February, 1950, he noticed that his skin had darkened and that he had lost 40 lb. (18.1 kg.). When he entered the hospital for diagnosis and treatment, he was so weak that the slightest effort exhausted him. On admission, he appeared to be chronically ill, showing a marked degree of weight loss and fatigue. Patches of brownish pigmentation were noted on the oral mucous membranes, in creases, and at pressure points. Blood pressure was 80/40. Body and axillary hair was sparse. The pubic hair and genitalia were normal. Except for slight generalized lymphadenopathy, results of physical examination were normal. A roentgenogram of the chest for tuberculosis was normal, as was a roentgenogram of the adrenal area. Administration of 0.3 cc. of epinephrine resulted in a drop of 65% in the circulating eosinophils. On the basis of this, a six-day period of corticotropin (ACTH) therapy, 20 to 40 mg. daily, was instituted, without benefit. Shortly after this, a mild Addisonian crisis developed. After recovery, the patient was placed on a daily regimen of 5 mg. of desoxycorticosterone acetate by injection, 3 gm. of sodium chloride in addition to the sodium chloride contained in a high protein diet, and 30 mg. of methyltestosterone. Symptomatic improvement was noted with this regimen. However, the patient was unable to return to his previous occupation of truck driving and was able to follow only a limited program of physical activity. In October, 1950, he contracted an upper respiratory infection; this was followed by an acute Addisonian crisis. In January, 1951, his condition was reevaluated. His skin had become more deeply pigmented, and the lymphadenopathy had persisted. Blood pressure was 110/80. He was given a daily dose of 25 mg. of cortisone orally, and in approximately 10 days he began to note gain in strength and well-being. In three weeks he was on a program of full physical activity, without fatigue. In two months, while receiving cortisone in doses varying from 12.5 to 100 mg. daily, he gained 30 lb. (13.6 kg.). All evidence of asthenia disappeared. The patient said that he felt as well while receiving 12.5 mg. as he did while receiving 100 mg. of cortisone daily. There was no decrease in skin pigmentation, and libido and potentia coeundi remained unaltered.

The following laboratory results were obtained before cortisone therapy was instituted. The glucose tolerance curve after ingestion of 100 gm. of glucose was: fasting, 102 mg. per 100 cc.; after one-half hour, 110 mg.; after one hour, 130 mg.; after two hours, 138 mg.; and after three hours, 110 mg. per 100 cc. Serum sodium was 135 mEq per liter; serum potassium was 4.5 mEq per liter; serum chloride was 105 mEq per liter; and carbon dioxide was 24 mEq per liter. The blood urea nitrogen level was 16 mg. per 100 cc.; urinary 17-ketosteroids were 4.4 mg. in 24 hours, and 11-oxysteroids were 1.26 mg. in 24 hours. Water tests were positive; the total night urine volume was 190 cc., and the largest single day urine volume was 75 cc.; the urea chloride index was 9.

The following laboratory results were obtained two months after cortisone therapy, on the dosage schedule given above, was instituted. The glucose tolerance curve, after ingestion of 100 gm. of glucose was: fasting, 78 mg. per 100 cc.; after one-half hour, 134 mg. per 100 cc.; after one hour, 155 mg.; after two hours, 98 mg.; and after three hours, 30 mg. per 100 cc. Blood chemistry determinations were the same as before cortisone therapy was instituted; urinary 17-ketosteroids were 6.2 mg. per 24 hours, and 11-oxysteroids were 3.26 mg. per 24 hours. Results of water tests remained positive, with the administration of doses of 25, 50, and 100 mg. of cortisone daily; each dose was given for a period of at least one week but was omitted on the morning of the water test. After two weeks of treatment with 25 mg. of cortisone daily, at 8:30 a. m. on the morning of the water test, the patient was given a single dose of 100 mg. of cortisone in tablet form, and, for the first time, the results of the test were normal. The result of a test on the following day, preceded by the administration of 12.5 mg. of cortisone, was also normal.

CASE 3.—R. E. B., a 30-year-old white man, complained of weakness, weight loss, nausea, and vomiting. He first was diagnosed as having Addison's disease in 1945, while in the Southwest Pacific. He had been maintained on a regimen of desoxycorticosterone acetate implants of 800 to 1,000 mg. at intervals of 10 to 12 months. Except for the decrease in work capacity and recurrent attacks of severe hypoglycemia, he felt fairly well. In December, 1950, daily administration of 5 mg. of desoxycorticosterone acetate, by buccal absorption, and 10 mg. of sodium chloride, in tablet form, was started. Examination revealed a well-developed man with moderate pigmentation. He gave the impression of having a low degree of intelligence, although he had an excellent record as a student and had graduated from the United States Naval Academy. His blood pressure was 128/80. Except for mild bilateral gynecomastia, results of the physical examination were essentially normal. On April 5, 1951, after a period of unconsciousness that lasted 36 hours, he was admitted to the hospital. The coma had been caused by prolonged hypoglycemia. Blood sugar, on his admission to another hospital, was 30 mg. per 100 cc. (Folin and Wu method). Physical findings were unchanged except for the disappearance of the gynecomastia. Because of the obvious hypoglycemia and mental changes, treatment with 50 mg. of cortisone daily was started. In 10 days he began to manifest subjective improvement, and after two weeks he stated that he felt better than at any time since the onset of his illness.

The following laboratory results were obtained before cortisone therapy was instituted. A roentgenogram of the thorax for pulmonary tuberculosis was normal, as was a roentgenogram of the adrenal area for calcification. The glucose tolerance level, after ingestion of 100 gm. of glucose, was: fasting, 48 mg. per 100 cc.; after one-half hour, 114 mg.; after one hour, 126 mg.; after two hours, 175 mg.; and, after three hours, 92 mg. Serum sodium was 134 mEq per liter; serum potassium was 4.6 mEq per liter; chloride was 108 mEq per liter; and carbon dioxide was 26 mEq per liter. The blood urea nitrogen level was 18 mg. per 100 cc.; urinary 17-ketosteroids were 4.4 and 5.5 in 24 hours; 11-oxysteroids were 0.75 mg. in 24 hours. The water test was positive in both parts. The night urine volume was 280 cc., and the largest single day volume was 180 cc.; the urea chloride index was 11.

The following laboratory results were obtained after cortisone therapy, 50 mg. daily in one dose, was instituted. The glucose tolerance curve, after ingestion of 100 gm. of glucose was: fasting, 86 mg. per 100 cc.; after one-half hour, 110 mg.; after one hour, 114 mg.; after two hours, 62 mg.; and, after three hours, 78 mg. per 100 cc. The serum sodium level was 137 mEq per liter; blood chemistry determinations were otherwise the same as before cortisone therapy was instituted. Urinary 17-ketosteroids were 5.9 mg. in 24 hours, and 11-oxysteroids were 4.25 mg. in 24 hours. The water test was slightly positive in part one but negative in part two. The night urine volume was 510 cc., and the largest day volume was 470 cc.; the urea chloride index was 59.

CASE 4.—F. McC., a 58-year-old white man, had his first attack of Addison's disease in 1946; it was characterized by weakness, weight loss, nausea, vomiting, and persistent fever. At that time, deep pigmentation of the exposed areas of the skin was noted. Blood pressure averaged 100/80. Roentgenograms of the chest revealed old healed bilateral apical pulmonary tuberculosis. No calcification of the adrenals was found. Daily treatment was started with 2.5 mg. of desoxycorticosterone acetate given intramuscularly and 2 gm. of sodium chloride by mouth. The patient remained in a decidedly weakened state until 1949, when treatment with desoxycorticosterone acetate pellet implants was started, with general improvement. The effect of an implant of 1,000 mg. lasted 10 to 14 months. In April, 1950, the patient had an acute febrile episode, with moderate nausea and vomiting but no signs of an Addisonian crisis. At that time, he appeared well developed and well nourished. His skin and oral mucous membrane were moderately pigmented. He had normal facial and axillary hair but no hair on his chest; pubic hair was sparse and of female configuration. Blood pressure was 130/80. The testes were small but of normal consistency. Results of the rest of the examination were essentially normal. During this febrile episode, the patient was given 200 mg. of cortisone and 5 mg. of desoxycorticosterone acetate daily, with salt and glucose intravenously. His recovery was uneventful. Oral cortisone therapy, 25 mg. daily, was begun on March 15. One week after this treatment was started, the patient felt stronger and the result of a water test was normal. Two weeks later, the dose of cortisone was reduced to 12.5 mg. daily, with continued improvement in strength and well-being. The patient continued to receive daily, 12.5 mg. of cortisone orally and 3 mg. of desoxycorticosterone acetate intramuscularly, along with 2 gm. of sodium chloride.

The following laboratory results were obtained before cortisone therapy was instituted. The urinary sodium excretion averaged 7.5 gm. per 24 hours. The glucose tolerance curve after ingestion of 100 gm. of glucose was: fasting, 58 mg.; after one-half hour, 106 mg.; after one hour, 118 mg.; after two hours 50 mg.; and after three hours, 94 mg. per 100 cc. Serum sodium was 139 mEq per liter; serum potassium was 4.4 mEq per liter; chlorides were 100 mEq per liter; and carbon dioxide was 27 mEq per liter. The blood urea nitrogen level was 14 mg. per 100 cc. The water test showed that the night volume of urine was 250 cc., and the largest single day volume was 40 cc.; the urea chloride index was 1.

The following laboratory results were obtained after cortisone was administered for three weeks, in doses of 25 mg. daily, and then in doses of 12.5 mg. daily. The urinary sodium excretion averaged 3.4 gm. in 24 hours. The blood chemistry determinations were essentially normal; the urinary 17-ketosteroids were 5.7 mg. in 24 hours, and urinary 11-oxysteroids were 2.02 mg. in 24 hours. The water test, performed while the patient was receiving 12.5 mg. of cortisone orally, was negative in both parts; the night urine volume was 250 cc., and the largest single day volume was 590 cc.; the urea chloride index was 92.

CASE 5.—J. A., a 43-year-old white man, had been diabetic since 1936. In May, 1949, a diagnosis of Addison's disease was made.[6] Weakness, exhaustion, cutaneous pigmentation, hypotension, and anemia were present. The result of a water test was positive. Blood chemistry determinations resembled those found in adrenal cortical insufficiency. Urinary 17-ketosteroid excretion was 2.6 mg. and 3.0 mg. in 24 hours, and urinary corticosteroid excretion was 1.06, 0.66, and 0.73 mg. on three occasions, a value considered normal by the method used. A daily dose of 12 units of protamine zinc insulin and 26 units of regular insulin was required to control the diabetes mellitus; this was little less than that required before the onset of Addison's disease. The normal urinary oxysteroid excretion and relatively high insulin requirement cast some doubt on the diagnosis of Addison's disease; however, by December, 1949, the patient was required to take 1 to 2 cc. of lipo-adrenal cortex daily, in order to avoid hypoglycemia. This enabled him to continue his accustomed dose of insulin. At this time, he was also taking 30 mg. of methyltestosterone daily. In October, 1950, the patient had a severe insulin reaction, followed by an Addisonian crisis in which his daily insulin requirement dropped to 2 to 4 units of regular insulin. Large amounts of aqueous adrenal cortex and lipo-adrenal cortex were necessary at this time. In December, 1950, examination revealed a well-developed, markedly asthenic, pale, moderately pigmented person. Pigmentation of the lips and mucous membranes was pronounced, as was asthenia. Blood pressure was 110 to 120/80. Body hair, other than pubic, was absent, and facial hair was normal. The results of examination were otherwise normal. Intramuscular treatment with 25 mg. of cortisone daily was started. In January, 1951, oral cortisone therapy, in the same dosage, was begun. The patient stated he felt better during oral than during intramuscular treatment. The insulin dosage remained unchanged. Attacks of hypoglycemia disappeared, and the patient's diabetic control improved markedly, with less glycosuria. In March, 1951, the patient changed to NPH-50 insulin, at which time it was necessary to increase his insulin dose to 52 units daily. His diabetes remains well controlled, without attacks of hypoglycemia and with urinary glucose averaging 6 gm. per 24 hours. In addition to the daily dose of 25 mg. of cortisone taken by mouth, the patient receives 4 mg. of desoxycorticosterone acetate by buccal absorption. The cutaneous pigmentation has decreased, and the pubic hair is more profuse; libido and potentia coeundi are unchanged. The patient has gained 16 lb. (7.3 kg.) since starting cortisone therapy. His daily diet contains 80 gm. of protein, 185 gm. of carbohydrate, and 157 gm. of fat. He has a constant feeling of well-being and is able to be fully active throughout the day without undue fatigue.

The following laboratory results were obtained before cortisone therapy was instituted. Roentgenogram examination of the chest revealed calcified right hilar nodes, and a roentgenogram of adrenal areas showed no calcification. Fasting blood sugar, after a 12 hour fast, was 50 mg. per 100 cc. (Folin and Wu method); serum sodium was 142 mEq per liter; potassium was 4.5 mEq per liter; and chloride was 102 mEq per liter. The blood urea nitrogen level was 16 mg.; urinary 17-ketosteroids were 2.3 and 3.0 mg. per 24 hours; 11-oxysteroids were 1.06, 0.66, and 0.73 mg. per 24 hours. A water test performed in 1949 showed positive results. The night urine volume was 710 cc., and the largest single day volume was 135 cc.; the urea chloride index was 5.

The following laboratory results were obtained after cortisone had been administered for three months, in doses of 25 mg. orally, daily. The fasting blood sugar, after 18 hours fast, was 120 mg. per 100 cc. (Folin and Wu method); the blood chemistry determinations remained essentially unchanged; urinary 17-ketosteroids were 7.8 mg. per 24 hours; 11-oxysteroids were 2.3 mg. per 24 hours. The water test was negative in both parts; the night urine volume was 310 cc., and the largest single day volume was 400 cc.; the urea chloride index was 40.

CASE 6.—E. M. M., a 41-year-old white woman, was operated on in 1947, at the Mayo Clinic, for the intracapsular removal of a chromophobe adenoma of the pituitary. Postoperatively, she showed signs of adrenal cortical insufficiency and was maintained on a daily regimen of 10 cc. of aqueous adrenal cortex and 2 mg. of desoxycorticosterone acetate given intramuscularly, 0.5 grain (0.03 gm.) of thyroid, 10 mg. of methyltestosterone, and 0.5 mg. of diethylstilbestrol given orally. No 17-ketosteroids were demonstrable in the urine, and blood chemistry determinations were compatible with the impression of adrenal cortical insufficiency. Early in 1948, the patient, because of recurrent attacks of hypoglycemia, was treated with lipo-adrenal cortex,

6. Ward, E.; Parkin, T. W., and Howell, L. P.: Diabetes Mellitus and Addison's Disease: Report of a Case with Normal Urinary Corticosteroids and High Insulin Requirement, Proc. Staff Meet., Mayo Clin. 25: 145 (March 29) 1950.

1 cc. daily, in place of aqueous adrenal cortex extract. She remained well, except for mild symptoms of adrenal cortical insufficiency induced by excessive fatigue or occasional upper respiratory infections. By June, 1950, she had undergone marked masculinizing changes, with facial acne and hirsutism, enlargement of the clitoris, and deepening of the voice. Methyltestosterone therapy was discontinued, and the changes disappeared. In January, 1951, the patient appeared well developed and well nourished, and with a fair complexion. The left frontotemporal depression of the skull, at the site of the pituitary operation, was visible. There were numerous acneform scars on the face. The scalp and pubic hair was abundant, but axillary hair was sparse. The breasts were full, but little breast tissue was palpable. The pelvic organs were normal. Blood pressure was 120/70. Results of physical examination were otherwise normal. Oral cortisone therapy, in doses of 25 mg. daily, was started. Administration of thyroid and estrogenic hormone was continued as before, and desoxycorticosterone acetate, 4 mg., was taken by buccal absorption. After 10 days of cortisone therapy, there was a definite increase in strength and well-being. After three weeks, the dose of cortisone was reduced to 12.5 mg. daily. The patient gained 10 lb. (45 kg.) over a two month period, without evidence of fluid retention. She felt well while receiving 12.5 mg. of cortisone orally, 4 mg. of desoxycorticosterone acetate by buccal absorption, 1 grain (0.06 gm.) of thyroid, and 0.05 mg. of ethinyl estradiol. She is able to perform her housework with ease, and, for the first time in many years, she is able to engage in outside activities. Menses, absent since 1943, recurred after one month of cortisone therapy and now occur regularly, every 28 days. There has been a recent slight, but definite, increase in facial hair.

The following laboratory results were obtained before cortisone therapy was instituted. The blood chemistry determinations of serum sodium, potassium, and chloride were within normal limits; no 17-ketosteroids were found in the urine (1949).

The following laboratory results were obtained after four months of cortisone therapy, with a single daily dose of 12.5 mg. The glucose tolerance curve after ingestion of 100 gm. of glucose was: fasting, 87 mg.; after one-half hour, 133 mg.; after one hour, 136 mg.; after two hours, 131 mg. and after three hours, 66 mg. per 100 cc. (Folin and Wu method). The blood chemistry determinations remained within normal limits; the urinary 17-ketosteroids were 4.2 mg. in 24 hours, and the 11-oxysteroids were 1.0 mg. in 24 hours. The water test was slightly positive; the total night volume of urine was 420 cc., and the largest single daily volume was 370 cc.; the urea chloride index was 30.

COMMENT

In all patients, clinical improvement was preceded by a lag period of 5 to 10 days. This delay in response was noted whether cortisone was given in single dose or in divided daily doses of 12.5 to 50 mg., without regard to the size of the initial dose. It may be that this period of time is required to overcome the inertia of cellular reactions, which are at low ebb in the presence of inadequate amounts of adrenal cortical hormones. A dose of 6.25 mg. twice daily was generally sufficient to produce slight improvement in strength and well-being; administration of 12.5 mg. once daily was more effective, and the ingestion of 25 mg. once daily induced the maximal response. When cortisone was given in a single daily dose, there was no diminution in clinical response. Indeed, the patients stated they felt better when the cortisone was given in this manner than when it was given in two or three divided doses throughout the 24 hours.

Once improvement in strength and well-being began, the change was dramatic, reaching a plateau in approximately 30 days. Increasing the dose of cortisone above 25 mg. was then without further benefit. In three cases, it was possible to maintain improvement with a dose of 12.5 mg. daily. In five patients, appetite improved with concomitant weight gain; in the sixth, the weight remained constant. Euphoria and optimism were evident. The patients, after one month of cortisone therapy, were able to resume, without undue fatigue, a program similar to that followed before the development of adrenal cortical insufficiency.

Carbohydrate Metabolism.—The tendency toward hypoglycemia, evident in many cases of adrenal cortical insufficiency, is prevented by parenterally administered cortisone.[7] This effect is present when cortisone is used orally. In those instances in which the fasting blood sugar levels remained in the hypoglycemic range and the three-hour values of the glucose tolerance test were dangerously low, the patients did not show the symptoms of hypoglycemia previously seen at such blood sugar levels. Thus, a resistance to the symptoms of hypoglycemia was demonstrated. In the patient with diabetes mellitus and Addison's disease, hypoglycemic reactions to insulin were prevented by the oral administration of 25 mg. of cortisone daily, with only a slight rise in insulin requirement, which may have been due to increase in diet. This increase in insulin requirement is in keeping with the observations of others.[8] The tendency for carbohydrate tolerance to be reduced by cortisone therapy may have been counterbalanced, in this patient, by the marked increase of physical activity noted since the start of cortisone therapy. However, this patient has had a relatively high daily insulin requirement and normal urinary corticosteroids since the onset of adrenal cortical insufficiency. The explanation of this phenomenon is obscure.

In general, the dose of cortisone given orally to produce satisfactory clinical remission in adrenal cortical insufficiency did not significantly alter carbohydrate tolerance, as demonstrated by the three-hour result of the glucose tolerance test, other than to tend to prevent hypoglycemia and improve the patients' ability to withstand fasting and to decrease the sensitivity to low blood sugar levels.

Urinary Steroid Excretions.—Alteration of excretion of urinary 17-ketosteroids was not remarkable. In several instances, the urinary 17-ketosteroids were increased but not to normal or near normal levels. Little change might be anticipated in the urinary 11-oxysteroid excretion with such small doses of cortisone, since at most only 5% of administered cortisone appears in the urine as corticosteroids.[8a] In two patients, a moderate increase in urinary 11-oxysteroid excretion was noted.

Serum Electrolytes.—When treatment with cortisone was started, a normal blood electrolyte pattern was present in all cases. In no instance was any change from the normal induced by the administration of cortisone. This might have been anticipated, since the patients were receiving desoxycorticosterone acetate in amounts sufficient to maintain electrolyte balance, whereas cortisone

7. Sprague, Kepler, Keating, and Power.[1b] Perera, Pines, Hamilton, and Vislocky.[1c] Thorn and others.[1e] Sprague, R. G.; Mason, H. L., and Power, M. H.: Studies of the Effects of Adrenal Cortical Hormones on Carbohydrate Metabolism in Human Subjects, Proc. Am. Diabetes A. **9**: 149, 1949.

8. Perera, Pines, Hamilton, and Vislocky.[1c] Boland, E. W., and Headley, N. E.: Effects of Cortisone Acetate on Rheumatoid Arthritis, J. A. M. A. **141**: 301 (Oct. 1) 1949.

8a. Thorn, G. W., and others: Medical Progress: The Clinical Usefulness of ACTH and Cortisone, New England J. Med. **242**: 783 (May 18) 1950.

has been found to be approximately one-fiftieth as effective as desoxycorticosterone acetate in causing retention of sodium.[1e] Sprague and his associates observed virtually no effect on the blood electrolytes when 100 mg. and 50 mg. of cortisone were administered daily in two patients with Addison's disease, who were receiving desoxycorticosterone acetate and 8 gm. of sodium chloride daily.[1f] In this study, all additional sodium chloride rations were discontinued when oral cortisone therapy was begun. Stopping the added daily ingestion of sodium chloride had no deleterious effect on the patients, and it did not alter the electrolyte concentrations in the blood.

Response to Ingestion of Water, as Demonstrated by the Robinson-Power-Kepler Water Test.—The occurrence of false positive results of water tests, in the patients studied, had been ruled out.[9] Results of repeated water tests previous to cortisone therapy were positive. After cortisone therapy was instituted, the patients had less difficulty in drinking the amount of water necessary for the test, and in five of the six patients there was marked improvement in diuretic response. In two patients, the water test results reverted to normal when they were given 25 mg. or less of cortisone daily; in a third, it became normal when, after a week of treatment with 25 mg. of cortisone daily, 100 mg. of cortisone was given on the morning of the water test. This reaction recurred despite the fact that results of the test had been repeatedly positive when 100 mg. of cortisone was given daily and the dose was omitted on the morning of the test. In two other patients, one of whom (E. M. M.) was taking 25 mg. of cortisone daily and the other (R. E. B.) was taking 50 mg., the urea chloride index became normal, and the difference between the largest daytime volume of urine passed and the night volume was in the range of 20 to 50 cc. This represents an equivocal response and may be considered normal. These findings are not in keeping with those of Thorn and his associates,[10] who stated that, in the majority of cases, the reversal of the results of the water test requires a larger dose of cortisone alone than of cortisone in combination with adequate doses of desoxycorticosterone acetate; this combination is capable of inducing optimal symptomatic improvement in patients with Addison's disease. There was no change in the result of the water test of patient A. B. while he was receiving cortisone. The return of the diuretic response to normal, with cortisone therapy, may depend on the capacity of the renal tubular cells to respond to the changes produced by cortisone either acting directly on the cells or in some way interfering with the production, transport, or utilization of the pituitary antidiuretic hormone.[11] A larger series of cases will be necessary to permit accurate determination of the effect of cortisone on the water test.

Miscellaneous Observations.—There was no change in the blood pressure of the patients studied when cortisone was administered. There was, however, a marked subjective and objective increase in skin temperatures, with less discomfort on exposure to cold and to heat. Three patients noted a definite decrease in skin pigmentation; in the other three, there was little or no change. On direct questioning, the five patients with primary adrenal cortical failure noted no change in libido or potentia coeundi. E. M. M. noted a marked decrease in this regard when she discontinued testosterone therapy; no further change occurred with cortisone therapy. The anemia present in four of the patients before cortisone therapy responded well to this medication. Electrocardiographic findings in the patients studied were not unusual.

SUMMARY

The effect of oral cortisone therapy in four patients with primary chronic adrenal cortical insufficiency, one patient with primary chronic adrenal cortical insufficiency and diabetes mellitus, and one patient with chronic adrenal cortical insufficiency secondary to surgical removal of a chromophobe adenoma of the pituitary was studied over a period of three to five months. The optimal dose of cortisone required to induce satisfactory clinical remission in these patients was 12.5 mg. to 25 mg. daily. This was best given in a single daily dose.

In this dosage, cortisone produced dramatic clinical improvement in strength and well-being after a lag period of approximately one week. Maximal improvement occurred in three to four weeks after medication was started. The patients felt as well with doses of 12.5 mg. to 25 mg. as they did with doses of 100 mg. of cortisone daily. There were no significant changes in the glucose tolerance curves. Decreased sensitivity to hypoglycemia resulted, and there was some increase in urinary excretion of 17-ketosteroids and, in two cases, 11-oxysteroids. Oral cortisone therapy produced no significant changes in blood chemistry determinations; it caused the result of the Robinson-Power-Kepler water test to revert to normal in three cases and equivocal results of a similar test in two others; in one case the result continued to be positive.

CONCLUSION

Oral administration of cortisone in conjunction with the use of conventional doses of desoxycorticosterone acetate by buccal absorption is effective and valuable in cases of chronic adrenal cortical insufficiency. There were apparently no deleterious effects with the dosage employed (12.5 to 100 mg. daily).

405 N. Bedford Dr.

9. Levy, M. S.; Power, M. H., and Kepler, E. J.: The Specificity of the "Water Test" As a Diagnostic Procedure in Addison's Disease, J. Clin. Endocrinol. **6**: 607 (Sept.) 1946.

10. Thorn, G. W., and others: Advances in the Diagnosis and Treatment of Adrenal Insufficiency, Am. J. Med. **10**: 595 (May) 1951.

11. Gaunt, R.; Birnie, J. H., and Eversole, W. J.: Adrenal Cortex and Water Metabolism, Physiol. Rev. **29**: 281 (Oct.) 1949.

Emotional Reactions to Disease.—No one can tell what will be his own reaction to the belief that he has a fatal illness. It is difficult to imagine being without a forward outlook, to know that one's course will be inevitably downward. Hopelessness has a highly morbific effect. Some bear it with resignation. Some refuse to accept it, question the diagnosis and persist in seeking further advice and newer or different treatments. Some fortunate people bear it with fortitude and remain interested in other people and their activities. Some become disagreeable, ugly and unpleasant, jealous of the health enjoyed by others and angry that they should be hopelessly ill. These unhappy people are difficult to help. Almost no one bears it with equanimity. Almost without exception the patient loses energy and feels a lassitude, a weakness and fatigue bordering on exhaustion; symptoms due to the emotional disturbance quite apart from those directly caused by the lesion.—R. Ian MacDonald, M.D., and R. F. Farquharson, M.B., Emotional Manifestations Associated with Structural Disease, *The Medical Clinics of North America*, March, 1952.

SELECTION OF DUODENAL ULCER PATIENTS FOR VAGOTOMY

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and
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Vagotomy in the surgical treatment of duodenal and anastomotic peptic ulcers has been reported as a satisfactory procedure by large clinics with a wide experience with this method.[1] In our experience with more than 600 vagotomies, success has depended on the following four factors: (1) a careful selection of patients, (2) the skill and experience of the surgeon in achieving a complete vagotomy, (3) the incorporation of a drainage procedure, preferably pyloroplasty, to avoid retention, and (4) the prolonged postoperative management of the patient until gastrointestinal function has been readjusted.

We wish to report in this paper our experience with the selection of patients for surgery. This subject needs much more careful attention and emphasis than it has received in the medical literature. The accompanying table illustrates the contrast in percentage distribution of patients by the primary indications for surgery between the first 350 cases [1d] in our series and the latest 100. The striking feature is the marked diminution in the number of vagotomies done for intractable ulcer, with a corresponding increase in those done for other major indications. It is our present opinion that the change has resulted from the introduction of methantheline (banthine®) bromide and tetraethylammonium (etamon®) chloride as adjuncts to medical therapy and from the greater use of the psychological approach to diagnostic appraisal and therapy.

*Primary Indications for Vagotomy in Two Series of Cases**

Primary Indication for Surgery	Group of First 350 Vagotomies, %	Group of 100 Most Recent Vagotomies, %
Inadequate medical response (intractable pain, intractable ulcer)	57	25
Hemorrhage	34	34
Pyloric obstruction	7	28
Multiple perforations	2	5
Diagnostic exploration	0	6
Occupational or economic necessity	0	2

* Multiple indications for entire group, 38%. Peak incidence of surgical complications, fourth year of illness, with the majority of cases occurring between second and sixth year of illness.

INTRACTABLE ULCER

It should be emphasized that the appraisal of response to medical therapy must not be left entirely to the judgment of the patient or his own private physician, unless detailed factual information regarding the therapy can be obtained. We have made it a practice to make an independent observation for a period of at least eight weeks on an ambulatory basis, followed by a period of hospitalization if the patient fails to respond. In general, the patients who respond poorly to optimal medical management fall into two fairly well defined groups: (1) the organic group, comprising those who show considerable objective evidence of organic pathology, such as large craters, penetrating craters, inflammatory masses, and marked duodenal deformities, usually with at least a partial pyloric obstruction, and (2) the psychosomatic group, comprising those who show minimal evidence of ulcer pathology but have a large overlay of psychic distress. This classification is not to be regarded as hard and fast, since there is overlapping of these two groups, but it serves as a basis for the selection of cases for definitive surgery. Our own experience to date leads us to believe that psychic factors coexist in both groups. In the organic group our major emphasis has been to bring to bear the entire armamentarium of therapy in order to achieve healing with a strict avoidance of the psychotherapeutic approach until the organic lesion is well healed. In these patients psychologic probing frequently aggravates the illness. It is in this group that the use of methantheline and tetraethylammonium has been of distinct advantage. However, it must be borne in mind that these drugs have their limitations. Of 25 recent patients who eventually were treated by vagotomy, 17 failed to attain full relief with methantheline for one reason or another. Six of these had partial obstruction that was aggravated by methantheline. This effect of this drug in certain cases of partial obstruction is now well known and is presumed to be due to its effect of producing a considerable reduction in gastric tone. In the others, symptoms continued despite a complete hospital regimen supplemented by the use of methantheline in dosages varying from 400 to 800 mg. daily for periods ranging from two to four weeks. We have not as yet analyzed our total experience with methantheline, which at the moment is a favorable one, but we wish to make the point that there is no drug that can safely and continuously block vagal stimuli completely. In this sense, methantheline or tetraethylammonium cannot be regarded as equal substitutes for surgical vagus section.

In the predominantly psychosomatic group our emphasis has shifted to the use of psychologic methods both for diagnostic appraisal and therapy. In these patients the usual ritual of the bland diet, the milk bottle, and a variety of pills and medicines imposes such restrictions on the normal routine of living that they frequently rebel and stop therapy at the earliest moment of freedom from symptoms. The inevitable result is relapse. Since it is now known that after each remission these patients continue to show high rates of gastric secretion, it follows that ef-

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Reviewed in the Veterans Administration and published with the approval of the chief medical director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

1. (*a*) Dragstedt, L. R., and Woodward, E. R.: Appraisal of Vagotomy for Peptic Ulcer After Seven Years, J. A. M. A. **145**: 795 (March 17) 1951. (*b*) Crile, G., Jr., and Brown, G. M., Jr.: Vagotomy as a Treatment for Marginal Ulcer, Gastroenterology **17**: 14, 1951. (*c*) Crile, G., Jr.: Management of Peptic Ulcer, Postgrad. Med. **8**: 28, 1950. (*d*) Weinberg, J. A.; Kraus, A. R.; Stempien, S. J., and Wilkins, F. B.: Vagotomy in the Treatment of Duodenal Ulcer: Results in 350 Consecutive Cases, A. M. A. Arch. Surg. **62**: 161, 1951. (*e*) Grimson, K. S., and others: Vagotomy: Observations During 4 Years, Surgery **27**: 49 (Feb.) 1950.

fective medical treatment would have to be continuous. This, of course, would lead to an enslavement of the patient not only by his disease but also by his treatment. The only logical alternative is to attempt a major psychologic reorientation of these patients through appropriate psychotherapy, in order to achieve a major remission in the pathologic physiology of the stomach. The lack of the psychologic approach remains the most glaring deficiency in the medical management of the ulcer patient. Vagotomy or any other surgical procedure will not cure these patients of their total disease.

HEMORRHAGE

Massive hemorrhage from peptic ulcer is such an immediate potential threat to life that serious consideration should be given to its prevention and immediate control. Surgery is indicated as an emergency procedure if the medical control of hemorrhage fails and as an elective procedure in order to prevent hemorrhage from renewed ulceration. Our own data [1d] would indicate that vagotomy is an important adjunct in both instances. In the emergency situation, if the patient fails to respond favorably after the most complete antiulcer regimen and adequate blood replacement within a period of 48 hours, surgical interference is usually recommended. The surgical effort is directed at the control of bleeding by ligation of the bleeding vessel. If the patient withstands this procedure well in the judgment of the surgeon, a vagotomy is added. As for the elective procedure, it is our present rule to regard as a candidate for definitive surgery any patient who has had two or more hemorrhages requiring blood transfusions, regardless of his age, and any patient over 40 who has had a single massive hemorrhage due to ulcer.

OBSTRUCTION

Unremitting pyloroduodenal obstruction due to ulcer formation is so obviously a serious organic complication that surgical relief is imperative. The object of surgery is to remove or circumvent the obstruction by either a pyloroplasty or a gastroenterostomy. The addition of vagotomy has for its object the healing of the attendant ulcer and the prevention of its recurrence. In our clinic preference is given to pyloroplasty as the drainage procedure of choice for the following reasons: 1. Surgical exposure of the ulcer bearing area permits accurate diagnosis and localization. 2. There is a lessened tendency for the occurrence of the dumping syndrome. 3. There is a diminished frequency of postoperative gastritis, a complication that is much more frequent with gastroenterostomy. 4. Pyloroplasty eliminates the possibility of a later anastomotic ulcer in case the vagotomy should be incomplete. There are two additional points that remain to be emphasized in the management of ulcer patients with pyloric obstruction. There are some patients with a high grade of pyloric obstruction in whom the diagnosis is unnecessarily delayed because they do not vomit. These patients usually have large dilated stomachs that have lost their power of reverse peristalsis. Because of this lack of vomiting, they are usually in fairly good electrolytic balance, but an imbalance is likely to develop readily should vomiting occur or should continuous gastric suction be instituted. Once such a grade of obstruction has been demonstrated by barium study, the stomach should be completely emptied of barium by a large stomach tube and should be decompressed by continuous gastric suction for at least three days, followed by nightly emptying of the stomach contents by tube. Bland liquids and antacids should be used, but methantheline and atropine are usually contraindicated, because of their effect in further reducing tone of the stomach. It should be emphasized that the institution of continuous gastric suction is an immediate indication for daily replacement of water, sodium chloride, and potassium. There is also a group of patients with partial pyloric obstruction accompanied by a marked motor irritability of the stomach and duodenum, resulting in frequent and profuse vomiting. These patients frequently come in with marked electrolytic imbalance and dehydration despite the fact that subsequent x-ray examination may reveal little or no retention of barium beyond the six-hour period. In these patients the management should include full and complete atropinization and, most important of all, the restoration of fluids and electrolytes to normal.

MULTIPLE PERFORATIONS

Multiple perforations are regarded as an indication for vagotomy especially in those patients in whom perforation occurs without previous warning. There are some patients in whom the characteristic pattern of ulcer relapse is one of perforation without the occurrence of prodromal symptoms. Since these patients cannot be given continuous therapy, the interruption of this recurrence of perforation by definitive surgical means is usually necessary. Our data [1d] indicate that vagotomy is as satisfactory as any other surgical procedure in accomplishing this.

DIAGNOSTIC EXPLORATION

In a few cases, the primary surgical purpose has been one of diagnostic exploration in situations where the lesion could not be definitely localized and the problem of possible pyloric carcinoma was present. If the exploration revealed the lesion to be a benign duodenal ulcer, vagotomy and pyloroplasty were performed.

OCCUPATION AND ECONOMIC NECESSITY

The patient's occupation may be such that even a conscientious effort at medical treatment is not very rewarding. In our surgical group of patients, fully two-thirds have had one or more recurrences of ulcer annually. Such frequency of recurrences also imposes a considerable economic burden on the patients, both as a result of work stoppage and as a result of the expense of treatment. As is shown by our data (see accompanying table) we do not deal with this indication liberally.

ANASTOMOTIC ULCERS

It is now generally agreed that vagotomy has its greatest usefulness in the surgical management of anastomotic ulcers, whether they are present after gastrectomy or after gastroenterostomy. At this hospital we also give serious consideration to the feasibility of substituting a pyloroplasty for the gastroenterostomy. We are impressed by the frequent occurrence of gastritis in patients subjected to gastroenterostomy and feel that this can be minimized by the elimination of the anastomosis and a restoration of the normal gastrointestinal lumen. In many

instances the recurrence of symptoms after vagotomy and gastroenterostomy is not due to recurrence of ulcer but rather due to the development of a postoperative gastritis.

SUMMARY

Any surgical procedure, including vagotomy, should be used with reluctance in a patient who is thought to have an intractable ulcer. It may be that the patient and not the ulcer is intractable. Only after complete and total medical management fails should surgical interference be recommended. This medical management should include, when indicated, the use of methantheline (banthine®) bromide, tetraethylammonium (etamon®) chloride, and appropriate psychotherapy. In most instances vagotomy, as well as any other surgical procedure, should be reserved for the serious organic complications, such as obstruction, hemorrhage, multiple perforations, and anastomotic ulcers.

INTRA-ARTERIAL INFUSION—SIMPLIFIED TECHNIQUE

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Halsted [1] was the first in this country to use the arterial route for blood replacement when, in 1883, he bled patients suffering from carbon monoxide poisoning via the radial artery and, after whipping the blood in air, replaced it through the same artery. Little further use of this route was made until 1939, when Colonel Sam Seeley suggested the technique to Kohlstaedt and Page.[2] Since then many excellent reports have appeared attesting to its effectiveness in shock therapy.[3] Many different techniques have been described, all either complicated or requiring expensive apparatus.[4] There has been a high incidence of circulatory disturbances of the arm and hand among the reported cases, and some authors feel that it is only justified as a life-saving measure.[4b]

It is the purpose of this paper to present a simplified technique that has been found extremely effective and free of circulatory complications to date.

APPARATUS

This technique is adaptable to any commercial blood, plasma, or gelatin bottle having a needle air-vent. A recipient set that will withstand a pressure of 300 mm. of mercury can be used, and any of the companies producing expendable equipment for blood administration can supply a satisfactory set. Nonexpendable recipient sets can be used, if desired, by reinforcing weak points with adhesive tape. Ordinary blood bottles of the Baxter or Cutter type have been successfully used. The regular plastic expendable recipient sets have also proved useful when adapted for pressure by wrapping of the rubber-glass junction with adhesive tape (fig. 1). The most satisfactory recipient apparatus is the special pressure set with double filters and outflows, which is more efficient, convenient, and safe.

The pressure pump consists of a hand bulb from a sphygmomanometer connected through a "Y" metal adapter to the air inlet of the blood bottle and to the manometer. It is necessary that the system be free of leaks. In order to assure freedom from leaks, the needle used for the air inlet should be not larger than 20 gage and should be inserted only once. The hand bulb must be in good condition, and it has been found convenient to keep a special one just for this purpose.

In order to assure sterility an 18 in. (46 cm.) length of sterile expendable plastic tubing [5] is interposed between the pressure pump and the blood bottle. This tubing has a male Luer adaptor at one end and a female Luer adaptor at the other end. The female end is capped with a plastic cylinder containing a small cotton plug. This plug, when pushed into the female Luer adaptor with a sterile needle before the cap is removed, serves as an efficient air filter. The sterile air filter eliminates the necessity of sterilizing the pressure pump, and its effectiveness in preventing contamination of the solution has been verified by rigid bacteriological testing.

The arterial cannula [6] consists of a 15 gage spinal needle cut off to 1¼ in. (3 cm.) and having a blunt end (fig. 2). The stylet is sharpened to a pencil type point and protrudes slightly beyond the end of the cannula to facilitate the arterial puncture. Identical cannulas in 18 gage are kept available for use in children. Ordinary 15 gage needles may be used in the absence of these cannulas, but the cutting edge produces a larger defect in the artery and bleeding continues longer after withdrawal.

When a 500 cc. flask of blood is nearly empty, a hemostat may be applied to the tubing or the stopcock turned to the off position while a second unit is being placed in the system. Two flasks of blood may be placed in series so that when one is empty the other may be started immediately without interruption of the administration. Newer disposable transfusion sets for pressure administration as previously noted are available which allow two flasks of blood to be quickly set up in series.

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5. Marketed by Abbott Laboratories, North Chicago, Ill., under the name of venotube.®

6. Available through Cochrane Physicians Supplies, Inc., 133 E. 58th St., New York.

TECHNIQUE

After surgical preparation and draping of the wrist, a 1 in. (2.5 cm.) longitudinal incision is made over the area of palpable pulsation of the radial artery. The artery is exposed by blunt dissection, freed all around, and elevated over a small curved Kelly clamp. The artery is not incised but is entered directly with the cannula in a centripetal direction; the hub of the cannula is tied in place by means of a loose skin suture. One per cent procaine should be infiltrated around the artery prior to introducing the cannula in order to minimize spasm and thus facilitate the actual puncture. After the blood tubing and transfusion system is filled with blood, the tubing is clamped near the arterial end and pressure increased in the closed system to approximate 100 mm. Hg. The blood tubing is then connected to the cannula through a three-way stopcock. The blood bottle is hung at the same level as the patient's heart, and, when the clamp is removed, blood will flow until the pressure in the bottle balances the patient's mean arterial pressure. At this pressure, which can be read on the manometer, a drop of blood will hang in the drip indicator, pulsating with the heart beat. These pulsations are evidence that the system is functioning properly. Coarse fluctuations due to respiratory variations in blood pressure can also usually be seen.

Fig. 1.—Apparatus assembled for intra-arterial use. The ordinary transfusion set is shown, and attached to the air vent is the Y adapter, manometer, and hand bulb.

If a system does not transmit pressure freely, it may be due to arterial spasm, which can be eliminated by procaine (1% or 2%) injected into the stopcock or by stellate ganglion blocks. Blood clots forming in the cannula can usually be aspirated with a syringe attached to the stopcock. If fairly high flow rates of blood are maintained, it is probably wise to cut the flow down to a very slow drip every half-hour and allow the arm to be perfused with oxygenated blood for a few minutes. It is seldom necessary to maintain high flow rates for more than a few minutes, however, which would, in fact, entail the infusion of massive amounts of blood. Approximately 12 pt. (5.7 L.) of blood can be infused in 30 minutes if necessary. It has been found more advantageous to maintain the flow rate at a slow drip, increasing the speed of infusion only to attain a physiologically adequate mean pressure. It is possible to regulate the flow with great precision, and rates of as little as four or five drops per minute are easily maintained.

When it is desired to stop the infusion, the cannula is simply removed and pressure kept on the artery until the bleeding stops. Bleeding may be extremely brisk on removal of the cannula, but will stop in four or five minutes. The pressure should be just sufficient to control the bleeding and still allow blood to flow through the artery. Ligation of the artery has been unnecessary. The artery should be treated as veins are treated after ordinary venipuncture. Following this technique, all of our patients have had good radial artery pulsations and no vascular complications have been encountered.

COMMENT

Eighteen intra-arterial infusions have been performed to date. Gelatin solutions have been administered on three occasions and plasma on one occasion by this route. The patients have ranged from 9 to 63 years of age, and the procedure has been done both as an emergency and as a prophylactic measure. The infusion has been maintained for as long as five hours, and the response of all patients to intra-arterial transfusion has been gratifying. It is apparently possible to maintain patients in excellent condition during long and shocking procedures with less blood than when the intravenous route is used. Severe blood loss, when it occurs, can be promptly and adequately replaced.

Evidence of deficient circulation of the arm or hand has not been seen. The technique herein described entails very little danger to the patient. There is no reason to believe that the use of blood substitutes should cause gangrene of the fingers and hand or skin sloughs of the forearm as has been reported. It is true that, when high infusion rates into the radial artery are used, in a centripetal direction, the entire supply of oxygenated blood to that extremity may be stopped as efficiently as by a tourniquet. These tissues, however, can survive periods in excess of one hour during which the circulation is completely occluded by a tourniquet, and as pointed out earlier there is no necessity for using high flow rates for this long a period of time. Such circulatory disturbances must be due rather to direct injury of the artery or reflex spasm of the artery.

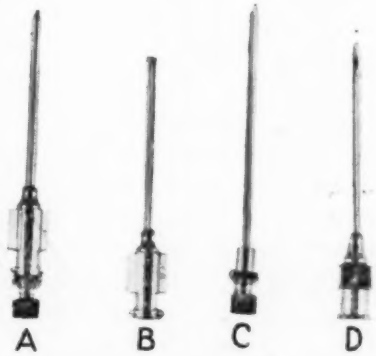

Fig. 2.—Cannula used for intra-arterial transfusion. *A*, the complete cannula (15 gage). *B*, the needle barrel, showing flat end. *C*, the stylet, showing the pencil type or conical point. *D*, ordinary 15 gage beveled needle.

To obviate the danger of direct injury of the artery, pressures are limited to 300 mm. Hg, and procaine is injected intra-arterially to prevent arterial spasm. Procaine solution (1% or 2%) in the amount of 5 to 10 cc. is injected into the side arm of the three-way stopcock and flushed into the artery by a very slow flow of blood in order to obtain prolonged contact of the procaine with the artery. This is repeated as often as necessary in anesthetized patients; the usual interval between injections is 30 minutes. The use of

intra-arterial procaine in unanesthetized patients is not recommended, but stellate ganglion blocks are indicated. In any circumstance arterial spasm must be adequately treated. Such spasm may be retrograde as far as the axillary artery and sufficient to completely occlude the blood flow to the hand. This situation in the present series could not always be overcome by local infiltration of procaine around the artery but could be completely overcome by the intra-arterial administration of procaine. After the infusion has been started, it is desirable to undrape the hand so as to permit continuous observation of the fingers. The hand on the side of the infusion is invariably of better color and temperature than the other hand if sufficient procaine is infiltrated intra-arterially.

In one case it was necessary to transect the radical artery in order to enter the lumen. The combination of spasm and shock was so severe in this patient that no blood could be aspirated from the cannula after its introduction. After 15 cc. of 2% procaine had been forced up the artery, it began to bleed sluggishly, and, after about 700 cc. of blood had been given, the mean arterial pressure had reached 100 mm. Hg. At this time the artery pumped vigorously from the distal cut end and the clamp had to be reapplied to include a rent in the artery that had not bled during the hypotensive period. This patient had excellent circulation in her hand postoperatively. This method of entering the artery is rarely necessary, but it is certainly justified as a lifesaving measure and should cause no difficulty unless the patient has an absent ulnar artery or anomaly of the volar arch.

SUMMARY

A technique for intra-arterial infusion is described. Emphasis is placed on simplicity, efficiency, and safety. The role of vasospasm in the production of gangrene is discussed and measures for its prevention outlined. Post-arterial puncture treatment consists in the application of pressure only. It is hoped that simplification of apparatus and technique will make for more widespread use of this valuable therapeutic measure. It is further hoped that realization of the advantages and of the freedom from serious sequelae will foster the use of this technique as a prophylactic measure in selected surgical cases.

SOME FUNDAMENTALS OF POSTGRADUATE EDUCATION FOR THE PHYSICIAN

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The purpose of postgraduate, or continuation, education is to keep the practicing general physician or specialist up-to-date. Its aim should be to stimulate the physician to such an extent that he continues to be a student of medicine throughout his professional life. Postgraduate education should not be confused with graduate education or residency training, through which a physician is trained to become a specialist in a given field of medical practice.

The rapid progress in all branches of medical science makes it essential that both general physicians and specialists constantly strive to keep informed about new medical knowledge and techniques. When one considers how quickly a physician's knowledge becomes outdated, one is impressed with the importance of this phase of medical education. It is encouraging, and yet frightening, to realize the amount of new information and the many changing ideas that can be brought forward in such a short period of time as five years. If we consider every practicing physician a potential postgraduate student, we begin to realize the magnitude of the possibilities in this field of medical education.

The physician who is a true medical student conducts the major portion of his program of continuing education in his active daily practice. He does this through the careful study of every patient under his charge. By frequent reference to monographs, reference textbooks, and current medical journals, he attempts to keep abreast of new information and to increase his store of fundamental knowledge concerning human beings in health and disease. Consultations about his patients with professional colleagues afford an excellent patient-centered instructional opportunity. Educational activities of the hospital's medical staff, such as x-ray and pathological conferences, departmental and staff meetings, may serve as a source of stimulation and information. Professional society meetings also add to the opportunities for continuation education open to the interested physician. Despite these opportunities, most physicians are confronted with the fact that each succeeding year their personal program of study becomes more inadequate. The young physician opening practice may find that he has ample opportunity, during the initial phase of his practice, to conduct an extensive program of study by utilizing many of the features mentioned above. As his practice grows, however, he finds that it becomes increasingly difficult to find time for the amount of studying that he feels he should do. The demands of his patients have priority over an evening with his medical journals or books.

Many different groups are now attempting to help the practicing physician meet his educational needs. Medical schools, hospitals, county, state, and national medical societies, foundations, and voluntary and governmental agencies are actively engaged in this field. Programs of widely different patterns, with somewhat different objectives, have been offered to physicians in all sections of the United States. A great deal of time, energy, and money is being expended. The effectiveness of these measures is difficult to measure at the present time.

An effective program of continuation education for physicians must be aimed at meeting the needs of the

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physicians. Some programs have failed because this fundamental idea has been overlooked. All too often, programs for general physicians have been planned by medical specialists and administrators who have little or no knowledge of the problems that confront the general physician daily. Such programs cannot hope to achieve maximum effectiveness. Frank discussions in hospital staff and county society meetings will often give invaluable aid in bringing out those areas of medical practice that most trouble the general physician. Properly organized questionnaires may afford a sampling of a large group of physicians, with a minimum of time and expense being required. Such inquiries will usually reveal that the practicing physician is most anxious to learn those things that will help him in the diagnosis and management of the common medical and surgical problems.

It is obvious that physicians' needs vary, depending on their initial training, conditions of medical practice, availability of consultants, and many other factors. A general physician in a large metropolitan center may refer all fractures and soft tissue injuries to a specialist. A physician practicing alone in a relatively isolated rural community may frequently be required to handle such problems. Fractures and traumatic surgery will be a matter of great interest to him. It is possible to consider the needs of physicians in two main groups; first, there is a need for information; second, there is a need for understanding and using new methods of diagnosis and treatment.

The needs of most practicing physicians are chiefly concerned with new information. In the busy practice of medicine, a host of questions are constantly arising. Is there a new and more effective antibiotic agent for brucellosis? Is there a better method for administering a certain new agent? How long should penicillin therapy be continued in the treatment of subacute bacterial endocarditis? What are the contraindications and side-effects of hormonal therapy? Questions of this sort are constantly plaguing the practicing physician. Unfortunately, he often has neither the time nor the library facilities to find the answers to these questions.

Learning to perform or to utilize new techniques or methods is another need that often confronts the practicing physician. He may wish to learn to interpret electrocardiograms, or the skilled use of local anesthetics in his obstetric practice may be his goal. The methods to be used in a program of continuation education for physicians should depend on the objectives in view. If the purpose is to transmit information, this can be effectively done by means of lectures. In recent years, there has been a tendency to underestimate the value of this method of learning; however, a stimulating lecturer, who makes full use of available audiovisual aids, still has a great contribution to make in this type of program. Lectures should not be prolonged. If one lecturer is to discuss an extensive subject, the period should be broken up by rest periods, during which questions or discussion may be encouraged. The use of panels of speakers to cover a broad subject will often serve to maintain interest at a higher level. We must remember that the time span of attention of physicians who have been away from the medical school atmosphere for years is considerably shorter than that of undergraduate medical students. If properly used, lectures will be a source of great stimulation and will offer a fund of valuable information.

Experience has taught us that courses should not be scheduled too rigidly, for, if we fall behind schedule, we find that students give too much attention to the schedule and not enough attention to the speaker. Ample time should be left for questions and discussion, and time should be provided for frequent, though brief, rest periods. The period after lunch is worthy of special consideration because of the wave of somnolence that so often prevails. We often ask our speakers to halt their lectures at intervals and give the class a 30 second period to stand and stretch.

The type of teaching program to be used in instructing physicians in the use of methods and techniques of diagnosis and treatment will usually require a different approach than the lecture method. For this type of teaching, small group instruction, either in the laboratory or at the bedside, may be required. Teaching in our outpatient clinic is an important part of this type of instruction. Continuation postgraduate courses may be further classified as to those that are given at the teaching center, such as the campus of the medical school or the teaching hospital, and those that are given in cities and towns at some distance from the parent hospital or medical school. Courses given at the medical center may further be subdivided into full-time courses and part-time courses.

The full-time courses require that the physician leave his practice during the period of the course and devote his entire time to his postgraduate studies. These courses may vary in duration from one or two days to several weeks or even months. It was the experience at the University of Minnesota that physicians preferred to come to the center for continuation study for courses of two or three days' duration. They apparently found it difficult to leave their practices for periods of one or two weeks. A physician practicing without associates must make arrangements with his colleagues to take over his practice while he is attending the course. It is easier to persuade a colleague to carry an extra load for a few days than for several weeks. The physicians indicated that they preferred to take three or four two-day or three-day continuation courses at intervals throughout the year than to take a single two-week course. The physicians also indicated that, even though a program carrying the educational opportunities out into the state was offered, they did not wish this to curtail the program that was offered at the medical center. Medical center courses afford the physician a brief respite from the responsibilities and cares of his practice and an opportunity to get back into the stimulating atmosphere of a teaching hospital and to confer informally with men in a wide variety of specialties.

Part-time courses may be given at the medical center or at regional centers. Such courses may meet for one or two hours or longer, once a week, for one or two months, or for an entire semester or school year. These courses require that the physician live in the city in which the course is given or within commuting distance of that city. The content of such courses depends on obtaining qualified teachers and the interests of the physicians for

whom the courses are intended. Part-time courses offer certain advantages. The physicians are kept in touch with the teaching program over an extended period of time; thus, certain types of material may be presented in smaller segments, and the physician may be given an opportunity to think through, digest, and apply the material of each session in the week that follows. In such subjects as electrocardiography and roentgenogram interpretations, more can be accomplished in 10 two-hour sessions given over a period of two and one-half months than in the same number of hours given over a period of two and one-half or three days.

For many years, various methods have been used to bring teachers from medical centers into contact with physicians practicing in peripheral regions. Some of these efforts have been built around "circuit riding" lecturers from the medical center, who traveled for a single day or for one or more weeks, stopping at different communities, giving lectures, holding clinics, and attending ward rounds with physicians in the community. The exact mechanisms used in such programs depend on the number of physicians in the community and surrounding area, the type of hospital facilities, and the objectives of the program. If the dissemination of information is the purpose of such a meeting, this can be accomplished by lectures and clinic presentations; on the other hand, techniques can be taught only at the bedside, in the laboratory, or in the examining room of the clinic. One advantage of such regional programs is that they carry information from a metropolitan area, in which there is, too often, an excess of medical meetings, and bring it to the rural communities where there is often a dearth of scientific assemblies. The disadvantage of the circuit riding program is that it often wastes the time of the teaching staff. Much of the time spent away from the parent institution may be nonproductive, in that it is spent in traveling to and from the peripheral teaching center.

Many regional internship and residency programs have been organized, expanding the opportunities for training house officers and providing a program of continuation education for the medical staff of the hospitals. In many such programs, medical faculty members of professorial status come to the peripheral hospitals for one day at regular intervals. On such occasions, they confer with the interns and residents, review their work, make ward rounds with the residents, which the staff of the hospital are invited to attend, and hold teaching clinics and conferences for the residents and other staff members. In these programs, such as the decentralized residency program at the University of Michigan, the resident from the local hospital may come to the medical school for one year at the midportion of his period of training. When he returns to the local hospital after this period at the medical school, it is hoped that he will be a source of greater stimulation in the local hospital. One danger must be constantly avoided in such decentralized programs of internship and residency training; the intern and the resident must not be exploited in order to provide a program of postgraduate education for the hospital's medical staff. The hospitals and the medical center have a primary obligation to the intern and the resident to see that their term of service is a well-planned teaching experience from which they will profit to the greatest possible degree.

Better methods of communication have already made possible other methods of bringing continuation education to the physician who lives outside of immediate contact with the medical center. Through leased wire broadcasts, one outstanding teacher may reach county society members throughout a wide geographic area. Arrangements can easily be made to have duplicate sets of lantern slides or other visual education materials available at each subsidiary center where the lecture is being broadcast. Two-way communication may even make it possible to have a question and answer period between the physician-student groups and the teacher at the broadcasting studio. Broadcasts in which an outstanding teacher of national or international fame speaks to audiences scattered over the entire United States are an exciting possibility for the near future. The development of television, particularly with color, may soon modify many of our present methods of continuation education. Circuit riding lecture courses may soon become a thing of the past. Technical devices that will limit the television audience to the physician of a community may soon make it possible to bring lectures, clinics, and demonstrations into the physician's home during an evening hour. It is impossible to estimate the impact that this may have on methods now being utilized in this field.

No set pattern can be created that will be equally well adapted to the program of postgraduate medical education in all sections of the United States; even the actual administration of such a program will vary from one place to another. In many areas, medical schools recognized early their responsibility in conducting a program of postgraduate education for physicians. In other regions, professional societies became active and organized and conducted an effective program. Lack of facilities at the teaching hospitals may make it necessary, in some centers, to hold the programs in hotels or other buildings. Climatic characteristics, road conditions, and availability of other methods of transportation will influence the type of program that can be presented.

Postgraduate medical education presents a challenge to medical educators and the entire profession. This challenge will be met only when all physicians have become life-long students of medicine.

Prevention of Addiction.—What can be done to prevent addiction from the therapeutic use of drugs? The recognition of the personality type which is susceptible to addiction is, obviously, very important. It is also very hard to do, but if the history indicates alcoholism or previous addiction to a drug, it should alert the doctor to the danger of addiction to all analgesic drugs. The physician must be quick to recognize the development of tolerance to drugs he prescribes. As soon as the dose of an analgesic drug has to be increased, one should suspect that tolerance is developing, and possibly physical and psychologic dependence as well. One should be especially careful in the treatment of diseases that are going to require drugs over a long period of time. I am thinking especially of the use of morphine or morphine derivatives in the treatment of chronic cough or diarrhea or for the pain of rheumatism, arthritis, or other chronic conditions. Barbiturates are sometimes used regularly over long periods of time in the treatment of hypertension and insomnia, and here too, the danger of addiction is real.—Walter Modell, M.D., Addiction as a Complication of the Therapeutic Use of Drugs, *New York State Journal of Medicine*, March 15, 1952.

BASIC PRINCIPLES IN THE SURGICAL TREATMENT OF DUODENAL ULCERS

Richard Lewisohn, M.D., New York

Almost 30 years have elapsed since the late Dr. A. A. Berg [1] and I [2] became convinced that in our hands gastroenterostomy was a complete failure in many cases of duodenal ulcer. At that time we advocated, for the first time in this country, that the operation of partial gastrectomy be employed in its stead as the surgical procedure of choice for duodenal ulcer. This decision was based largely upon the work of Haberer.[3]

Haberer's technique consisted in removing a distal one-half to two-thirds of the stomach together with the pylorus and the ulcerative lesion in the duodenum. This procedure apparently appeared unnecessarily radical to many surgeons. For this reason a great deal of antagonism was encountered when the method was first introduced. At a meeting of the American Medical Association in Washington [4] in 1927, where I presented results with partial gastrectomy as compared with results with gastroenterostomy, a leading surgeon stated in the discussion, "If any man wanted to cut out half of my good stomach in order to cure a little ulcer in my duodenum, I would run faster than he." After about 15 years of uphill work, and after encountering opposition that varied from severe criticism to polite amusement, this method gradually came to be accepted as the operation of choice for duodenal ulcer.

An intermediate step between gastroenterostomy and Haberer's method of gastric resection is represented by Finsterer's [5] so-called *Resektion zur Ausschaltung*. In this technique the dissection was not carried distal to the duodenal ulcer, but left the ulcer, the pylorus, and a small part of the antrum in situ. The distal part of the antrum was left solely in order to guarantee a safe closure of the duodenal stump, as the pylorus, a muscular organ, could not be used for that purpose.

Finsterer was aware of the great importance of the antral mucosa in the development of recurrent ulcer, especially gastrojejunal ulcer. For that reason he advocated the excision of the mucous membrane portion of the gastric stump by blunt dissection. Apparently the details of Finsterer's paper were not known to Bancroft [6] and Plenk,[7] who introduced similar methods in 1932 and 1936, respectively. Finsterer stated: "If the ulcer is of such size that it reaches from the pylorus to the papilla, the stomach must be transected close to the pylorus on the gastric side; the small distal stump of the stomach is closed after its mucous membrane has been excised as completely as possible." However, even with all these precautions secondary ulcers frequently appeared.

I have quoted from Finsterer's paper verbatim because he states clearly in this paper that this method should be used only in very large ulcers, those that reach from the pylorus to the papilla. However, this type of ulcer is very rare. In this relatively small group of cases it seems probable that a simple gastroenterostomy would be preferable to the major procedure advocated by Finsterer.

It should be emphasized that the excision of the mucosa of the antrum in its entirety is not an easy technical procedure, especially since severe gastritis is frequently encountered in the antral mucosa. The separation of the mucosa from the underlying muscularis may result in considerable oozing. Furthermore, the remaining shell of muscularis and serosa may be so thin that spontaneous perforations in this prepyloric pocket are likely to occur. This complication, which is often called a "blow-out," and erroneously attributed to back pressure in the duodenum, is probably due to local necrosis in the badly nourished tissue of the antral stump. If technical difficulties result in the retention of portions of the antral mucosa, its hormonal influence persists.

When, after many years of discussion, surgeons had become convinced that gastroenterostomy should be supplanted in most instances by a more radical procedure, and still were not willing to attack the ulcer directly, the Finsterer operation enjoyed short-lived favor. In some quarters the term "physiological gastrectomy" was employed to describe it. This has always appeared to me to be a badly conceived title. "Nonphysiological gastrectomy" would have been a better description, since secondary ulcers at or near the anastomosis often followed its employment.

For instance, the well-known British surgeon Sir Heneage Ogilvie [8] stated:

> When I published my second paper in the Edinburgh Medical Journal in 1936, I had had no reason in two years' trial to be anything but satisfied with the results of this procedure. Since then 9 out of 22 patients in whom "physiological gastrectomy" had been performed more than two years ago have been found on follow-up to have pain; 3 lost their symptoms after medical treatment, but 6 had definite jejunal ulcers requiring further operation. Of these 6 jejunal ulcers, 3 were in a series of 12 gastrectomies for duodenal ulcer, and 3 were among 10 patients previously operated on for jejunal ulcer following gastrojejunostomy. These unfortunate results are in marked contrast to about 100 gastrectomies in which the duodenum was divided, some of them under observation for 12 years, among whom no cases of recurrent ulceration, or indeed of more than minor discomfort, have been met.

The typical Finsterer operation is nowadays used so rarely that detailed discussion would appear to be unnecessary. However, the method is often used inad-

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vertently in a modified form by surgeons who prefer to leave the ulcerative lesion in the duodenum in situ. As regards the actual removal of the duodenal ulcer, there are at present two schools of thought. The first, representing the vast majority, prefers to remove the ulcer in the course of the gastrectomy. The second, constituting a smaller group, does not attempt to remove the ulcer except in those cases in which the presence of a freely mobile duodenum makes the dissection simple. The latter group claims that removal of the duodenal ulcer is unnecessarily radical. As a matter of fact, most duodenal ulcers are located in the first part of the duodenum, their proximal margin extending right up to the pylorus. The ulcer is usually surrounded by inflammatory tissue, which would make a safe closure just distal to the pylorus impossible. In order to insure an adequate duodenal closure, the line of transection would have to be carried proximally into the antrum. This is in fact a modified Finsterer procedure, with its ensuing risks of secondary ulcers at or near the gastrojejunal anastomosis. It should be emphasized that in only a few cases is the duodenal ulcer located so far distal to the pylorus that enough duodenum to effect a safe closure remains proximal to it.

After all, the safe closure of a duodenal stump is the *sine qua non* for a safe postoperative course. In the vast majority of cases this objective can be attained only by carrying the dissection distal to the ulcer and into a normal duodenum. Only in those rare cases in which the ulcer involves the common duct should such a dissection be hazardous. Ulcers in this particular location represent not more than about 5% of the cases. In other words, the actual excision of the duodenal ulcer in the course of a gastrectomy is usually an operation of necessity and not, as some surgeons seem to think, the operation of choice.

When such an ulcer is left in situ, the operation should be clearly labeled a "palliative resection." Otherwise recurrent symptoms may be erroneously attributed to the radical operation for duodenal ulcer, when, as a matter of fact, a modification of it is really used.

In the surgical treatment of gastric ulcer, conditions may occasionally exist that contraindicate the removal of the ulcer, though some surgeons, for instance Aird,[9] claim that any gastric ulcer is removable. However, when gastric ulcers are located very close to the cardia, the surgeon may be forced to leave the ulcer in situ and proceed with the gastric resection distal to the ulcer. This form of resection is never classified as subtotal gastrectomy, but always labeled a palliative resection for gastric ulcer, or a Madlener [10] operation. In this manner not the slightest doubt can exist that the ulcer was not attacked directly and thus may cause trouble (for instance, malignant degeneration) at a later date. It is a moot question whether the disappearance of a gastric ulcer following a Madlener operation is not simply due to a temporary, spontaneous disappearance of the ulcer (so-called life cycle).[11]

In the same manner, an operation for duodenal ulcer that does not remove the ulcer must be classified as a palliative resection, for a lax definition of an operative technique makes a correct evaluation of a statistical material impossible. Occasionally, in spite of the most careful palpation by an expert surgeon, no ulcer will be found. In these cases the diagnosis must be labeled an error, and these should not be described as cases of ulcer; otherwise statistics will lose their value.

X-ray findings alone cannot be the deciding factor with respect to gastric resection. X-rays may lead to error just the same as any other diagnostic method. In the absence of any objective visual or palpatory findings of ulcer at the operating table, a major resection should not be proceeded with simply because the roentgenologist has made a positive diagnosis of duodenal ulcer.

It must be understood that the specimen cannot and does not present a picture of the ulcer in its entirety in every case. For instance, if the Nissen [12] technique is used, only a part of the ulcer would be found on the specimen. However, if the pathologist reports that he could not find even a small part of an ulcer or definite evidence of a healed ulcer on the specimen, it must be assumed that either a typical or atypical Finsterer operation was performed or that the stomach was resected in the absence of a duodenal ulcer. However, one may encounter the occasional case, cited above, in which the upper margin of the ulcer is located at a point in the duodenum sufficiently distant from the pylorus to permit a closure in normal proximal duodenum.

VAGOTOMY

The impetus for the revival of vagotomy was given by Dragstedt,[13] who, in 1943, after performing careful animal experiments, suggested transthoracic vagotomy. In 1945 he replaced the transthoracic approach by the transabdominal,[14] for two reasons: (1) the importance of inspection of stomach and duodenum in order to prevent unnecessary surgery and (2) the great frequency of postoperative gastric stasis, which made coincident drainage operation, in the form of gastroenterostomy, imperative in the majority of cases. However, even after the performance of a gastroenterostomy, stasis in the small intestine was most annoying in many cases.

Nobody will deny that the removal of a duodenal ulcer is not always an easy procedure, certainly not for surgeons with only limited experience in gastric surgery. Unquestionably duodenal ulcers appearing easily resectable to one surgeon may be considered nonresectable by another, who will tend to welcome any new suggestion, such as supplemental employment of vagotomy, that might justify the use of gastroenterostomy instead of gastric resection. However, because of the increased experience acquired in many clinics, the initial enthusiasm for vagotomy has already subsided considerably.

It is too soon to say whether gastroenterostomy plus vagotomy will give better final results than simple gastroenterostomy. It must again be stressed that gastrojejunal ulcers have appeared at periods as late as 10 to 20 years after operation. A similar attitude must be adopted in regard to the practice of supplementing partial gastrectomy

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with vagotomy. I still believe, as I stated in 1948 at a meeting of the American Medical Association, that surgeons will eventually find that vagotomy is indicated only in a small group of cases, i. e., those in which recurrent anastomotic ulcers follow adequate subtotal gastrectomy.

CONCLUSIONS

1. Gastric resection for duodenal ulcer should include the removal of the ulcer in about 90% to 95% of the cases. This operation guarantees a much safer closure of the duodenum than the palliative operation devised by Finsterer.

2. The Madlener and Finsterer palliative operations should be used only in those very rare cases in which the location or size of the ulcer makes removal impossible.

3. In nonresectable duodenal ulcers simple gastroenterostomy, possibly supplemented by vagotomy, is preferable to Finsterer's so-called *Resektion zur Ausschaltung*.

4. Gastrojejunal and jejunal ulcers are observed much more frequently in cases in which the ulcer was left in situ than in those in which it was removed at the time of operation. For this reason gastric resections without removal of the duodenal ulcer should be clearly defined as palliative operations. An inaccurate definition of the operative technique makes a correct statistical evaluation of the surgical material impossible.

5. The role of vagotomy in the treatment of duodenal ulcers remains in doubt.

20 E. 16th St. (21).

URINARY RETENTION IN PREGNANCY

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In view of the large accumulation of literature concerning the upper part of the urinary tract during pregnancy, the little attention paid to the bladder under the same conditions seems remarkable. It is well known at about the fourth month of pregnancy ureteral dilatation begins, a condition of atonia that expresses itself as a relaxation of the smooth musculature of the ureters.[1] This dilatation is demonstrable by pyelography and includes the renal pelves. It is probably caused by the increased elaboration of progesterone at the beginning of the second trimester as the placenta takes over the functions of the corpus luteum.

At this time the bladder undergoes changes in keeping with those in the upper part of the urinary tract. With the hyperemia affecting all the pelvic organs, plus a definite hyperplasia of muscular and connective tissue elements, there is an elevation of the trigone and a thickening of its posterior or interureteric margin.[1] Langworthy and Brack [2] have shown that, in addition to the trigonal hypertrophy, progesterone is responsible for an increase in capacity and decreased tonicity of the rabbit bladder in pregnancy. Muellner [3] showed by cystometric studies that the human bladder also exhibits a gestational increased capacity and decreased tonicity, beginning in the third month.

These physiological changes in the bladder in pregnancy, coupled often with the mechanical pressure of the cervix of a retroverted uterus on the urethra and bladder neck are responsible for the fairly frequent occurrence of acute urinary retention during pregnancy. Although many obstetricians have seen such acute retention in their private practice, a search of the literature revealed a surprising dearth of material on the subject. We feel that prompt recognition of the syndrome is important, since the patient is seen by the physician when she is in acute distress, often with the abdominal rigidity and rebound tenderness that the inexperienced practitioner might erroneously regard as the abdomen of an acute condition requiring surgery.

Matthias Saxtorph [4] of Copenhagen, in 1775 reported a case in which a retroverted pregnant uterus caused complete urinary retention and death as the result of a ruptured bladder. Burdon and co-workers [5] reported a case of acute urinary retention in a primigravida, four months pregnant, caused by an incarcerated retroverted uterus. With the expanding uterus wedged below the sacral promontory, the cervix acted as a pressure point to effect urethral occlusion. Cystoscopy revealed edema of the internal orifice, possibly a contributory factor in the retention. Although Burdon and his associates were able to find only two other such cases in the available literature, we believe it occurs often enough to comprise a syndrome with which one should be familiar.

The following cases illustrate the acute onset of the retention and its usually rapid disappearance when proper therapy is instituted.

REPORT OF CASES

CASE 1.[6]—Mrs. R. H., a 32-year-old primigravida had an uneventful early pregnancy until the end of the fourth month, when acute, complete urinary retention suddenly developed. She was hospitalized, and examination revealed a pregnant uterus in normal position, with the bladder distended and very tender and the patient in acute distress. Catheterization obtained 1,000 cc. of clear urine, with complete relief. Further exploration disclosed no abnormalities, and bladder function spontaneously returned to normal and remained so for the duration of the pregnancy.

CASE 2.—Mrs. M. C., a 37-year-old woman, gravida 4, para 3, was seen by us early in the fourth month of pregnancy as an

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emergency, with severe abdominal pain. The uterus was normal in position and the bladder tremendously distended. Catheterization yielded 1,200 cc. of clear urine, with prompt relief. The patient continued to have mild dysuria for the next two weeks, which was decidedly relieved by oral therapy with neostigmine (prostigmin®) bromide. This patient had exactly the same type of acute retention with her next pregnancy, at the same stage of gestation, and was treated successfully in the same manner. Urological examination disclosed no abnormalities.

CASE 3.—Mrs. R. L., a 31-year-old woman, gravida 2, para 1, was admitted to an outlying hospital in the 15th week of pregnancy with severe abdominal pain and anuria. Catheterization yielded 1,100 cc. of urine. Cystoscopy was accomplished with difficulty and only by pronounced depression of the ocular end of the cystoscope. It revealed a greatly elevated trigone and an extravesical depression at the dome of the bladder. The patient was seen in consultation by Dr. Ralph A. Reis,[7] who found the acute urinary retention to be caused by an incarcerated retroverted uterus. The inability to void persisted until the uterus was manually replaced in normal position under general anesthesia. The remainder of the pregnancy was uneventful.

CASE 4.[8]—Mrs. A. R., a 24-year-old woman, gravida 2, para 1, experienced acute urinary retention in the third month of pregnancy, caused by an incarcerated retroverted uterus. She was seen in the office suffering extreme discomfort, which was relieved by catheterization. The uterus was manually replaced, and the patient had no further difficulty.

CASE 5.[9]—Mrs. T. L., a 22-year-old primigravida, was admitted as an emergency patient in the latter part of the third month of pregnancy, complaining of severe lower midline pain and an inability to urinate. The uterus was in a normal erect position, but cystoscopy revealed a narrowing of the bladder neck, possibly caused by dextrorotation of the uterus. An indwelling catheter was left in the bladder for one week before function returned.

In addition to the above cases, there were two cases in the private practice of Dr. J. P. Greenhill,[10] two in the practice of Dr. W. H. Rubovits,[11] and three in the practice of Dr. A. K. Koff [12] that were very similar to case 4, in that the condition in all seven was caused by an incarcerated retroverted uterus; the same treatment was used in each case.

COMMENT

None of these patients had any history of urinary symptoms prior to pregnancy. In each case the retention originated in the bladder, with the upper part of the urinary tract playing no role. In each case, therefore, we may conclude that the bladder may be profoundly influenced in early pregnancy, whether by intrinsic trigonal hypertrophy and decreased tonicity (as in cases 1, 2, and 5) or by direct pressure by the cervix of an incarcerated retroverted uterus on the urethra and bladder neck (as in cases 3 and 4).

One may elicit a history from these patients of an inability to urinate, but frequently they complain only of pain so severe that no mention is made of any urinary urge. The diagnosis is made by physical examination and catheterization. Abdominal examination reveals the bladder as a distinct rounded, tender mass, extending a variable distance between the symphysis and the umbilicus, flat to percussion, soft, and productive of a fluid wave. The uterus, if erect, can be palpated above this mass and is firm and nontender. Vaginal and rectovaginal examination are important. In cases of incarcerated retroverted uteri, the soft bladder mass is easily palpable abdominally; on rectovaginal examination the firm uterine fundus is felt, wedged in the cul-de-sac and pressing on the rectum, while the cervix is palpated high under the symphysis, pressing anteriorly on the bladder neck. Catheterization, important in any acute condition of the abdomen, will reveal a large quantity of urine, disappearance of the soft abdominal mass, and immediate relief of pain.

Since partial dextrorotation of the pregnant uterus is of common occurrence, it is possible that this twisting may be a contributory factor in these cases. Porcar and Baqués [13] reported a case of acute retention in a nonpregnant woman due to a twisted myomatous uterus.

In any discussion of urinary retention, the emotional factor must not be overlooked as a possible etiological agent. Cases of complete urinary retention caused by severe emotional stress have been reported.[14] It is equally possible that polyneuritis of pregnancy based on a thiamine deficiency may contribute toward bladder atony [15]; also, urethral obstruction by stricture, stone, urethral prolapse, or edema may produce retention.

SUMMARY

In general, acute urinary retention in early pregnancy, while not common, occurs frequently enough to be considered an important clinical entity. Any of the pathological conditions that may produce retention in the nonpregnant woman, i. e., obstructive lesions, stricture, stone, urethral prolapse, or edema, may do the same in pregnancy. However, the patient entering the second trimester of pregnancy often shows hypertrophy of the trigone, with increased bladder capacity and decreased tonicity, which may of itself cause failure of bladder function. Even more commonly, a growing incarcerated retroverted uterus may cause the anteriorly displaced cervix to occlude by pressure the urethra and bladder neck. Dextrorotation of the uterus, polyneuritis, and disturbed emotional states may be contributory factors.

It is of utmost importance that this condition is not mistaken for an acute condition requiring surgery, which it often resembles. Treatment is simply catheterization, replacement of the uterus if retroverted, and administration of bethanechol (urocholine®) chloride, neostigmine (prostigmin®) bromide, or pilocarpine.[16]

109 N. Wabash Ave.

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8. Dresner, M.: Personal communication to the authors.
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Interpretation of Roentgenograms.—The radiographs heed no specialty. He who takes the responsibility of interpreting them must have knowledge not only of his specialty but also of the radiology of all structures in the area, widely separated though they may be anatomically. A predominant interest in any one system may blind the observer to other evidence obvious to those who seek it. Even radiologists who are aware of the possibility, suffer in this way, and they come to recognize, with experience, shadows and appearances that they did not previously see.—James F. Brailsford, M.D., Factors Which Influence the Value of a Radiological Investigation, *Lancet*, April 5, 1952.

THE CERVICAL CAP

AN ADJUNCT IN THE TREATMENT OF MALE INFERTILITY

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and
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With the recognition of the importance of the male factor in barren marriages, much of the energy of infertility studies during recent years has been correspondingly diverted toward overcoming this obstacle. Although the beneficial possibilities of tubular regeneration by prolonged testosterone therapy, as noted by Heller and co-workers,[1] is worthy of note, hormonal therapy in the infertile male, with the exception of desiccated thyroid, has in general proved futile in the attempt to produce a more potent semen. As a result, certain mechanical therapeutic measures have been adopted in an effort to afford the maximum possibility of fertilization in the presence of any semen deficiencies. Oligospermia has been the particular target of mechanical aid.

Two methods are used. Both employ the principle of semen concentration. The first involves removal of the spermatozoa from the semen by dilution with Locke's solution and a subsequent process of centrifugation and decantation. In this way the spermatozoa are concentrated within a 1 cc. volume. Insemination with this volume has been intravaginal, intracervical, or intrauterine, and in the most recent study [2] has been intracervical but associated with the use of an artificial cervical plug to prevent backflow. The second method, first described by Whitelaw,[3] concerns the use of a relatively tight-fitting plastic cervical cap. This cap acts as a means of concentrating the entire ejaculate in close approximation with the external cervical os, in an environment favorable to sperm survival. In the present study the cervical cap has been employed in every case.

SELECTION OF COUPLES

All couples included in this group had experienced a reasonable period of infertility. With reference to the qualifications required of a couple to be included in our over-all sterility studies, as noted in a forthcoming publication,[4] all couples in this particular group had experienced sincere unsuccessful trial at conception for at least one and one-half years. Subjection of both partners to an intensive diagnostic and therapeutic regimen over a two to four-month period invariably preceded selection and established the basis for inclusion in the series.

Accepting a sperm count of 60 million per cubic centimeter as the arbitrary lower limit of the normal range, the principal criterion for admission to this special group was oligospermia of less than this figure. Other apparent deficiencies of the semen, mainly decreased motility and longevity, and abnormal morphology, were factors in selection. In this series these deficiencies, when present, were associated with oligospermia in every case. Multiple semen analyses were performed, according to the tenets of Falk and Kaufman,[5] before a diagnosis of deficiency was made.

Not infrequently other inhibiting factors to fertility were uncovered in couples included in this series, chiefly decreased metabolic function in one or both partners or other endocrine disturbances in the female partner, as noted mainly by the basal metabolic rate, vaginal smear, and endometrial biopsy. These factors were corrected promptly, and a further brief trial period of two to four months ensued before any capping procedure was attempted.

The use of the cervical cap in this series has now been extended to include well-selected cases with no apparent abnormality of the semen and in which other obvious sterility factors have been eliminated. These couples had had at least one year of therapy by other physicians and treatment by us from 6 to 12 months without success before capping technic was suggested.

A few of the couples in the group had a previous history of conception with a subsequent protracted period of infertility. Deficient semen was involved in one-half of these cases.

METHODS

Ovulatory time is determined by the vaginal smear technic.[4] The ovulatory smear pattern of each patient is established before capping is ventured. On this basis, by means of smears taken every 12 hours during the presumptive ovulatory phase, ovulation may be predicted fairly accurately with each subsequent cycle during which capping is done. In the capping series, ovulatory time was presumed to be ascertained with a high degree of certainty in at least 90% of the patients. This high frequency of diagnosis of presumptive ovulation is considerably higher than in the usual group of sterile couples, in which female endocrine abnormalities are more often noted. Rectal basal temperature charts are kept by all patients in addition to the vaginal smears and are used merely as supplementary evidence of ovulation. In only three cases in the capping series did the temperature chart prove superior to the vaginal smear as a means of diagnosing the presumptive time of ovulation.

Insemination procedures with the plastic cervical cap are carried out twice during the ovulatory phase of each cycle at 36-hour intervals. Arbitrarily we have considered an optimal capping schedule as one in which the first cap application takes place within 12 hours prior to presumptive ovulation. Generally capping was done in the 24 hours just preceding ovulation. The second capping, despite the shortened period of abstinence, was done as an insurance measure in event the ovulatory time was missed.

In every case the first capping was preceded by a three- to five-day period of abstinence. The specimen is collected by masturbation directly into a clean, wide-mouthed glass tube. This is done usually about 15 to 20 minutes before capping actually takes place. At least 10 minutes is always allowed after collection for liquefaction to occur, to prevent loss of semen in the transfer from tube to cap.

From the Department of Obstetrics and Gynecology, Washington University School of Medicine.

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The plastic caps [6] are manufactured in different sizes, as described by Whitelaw.[3] The size of the cap to be used in each case is determined during a routine examination of the patient some time prior to the date of the first insemination. The capping procedure is preceded by douching with a specially prepared neutralizing solution [6] that has been shown to be optimally favorable for sperm survival.[7] The rubber glove to be used is devoid of powder and is washed, as is the cap, with the same douche solution just before the insertion of the cap intravaginally. The entire ejaculate is poured into the cap. With the patient in the lithotomy position, and while the labia are spread with the gloved hand, the cap, containing the ejaculate, is placed in the introitus (fig. 1).

The index and middle fingers of the gloved hand are immediately placed in extension over the open portion of the cap. The cap is then slipped along the posterior vaginal wall while the gloved fingers maintain the open plane of the cap in an almost perfect horizontal position, so as to prevent spillage of the contents. When contact with the cervix is made by the finger tips, slightly added pressure toward the posterior vaginal wall almost always allows the cervix to fall directly into the cap as the fingers are slipped away from the open portion (fig. 2). Minimal pressure is then made by the gloved fingers on the bottom of the cap to apply it more securely to the cervix. For all practical purposes the specimen is now sealed inside the cap at the cervical os.

Fig. 1.—The cervical cap in place at the introitus.

When the cap has been properly fitted and inserted, a minimal negative pressure develops within the cap, as noted on removal. It is usually more difficult to remove a cervical cap than to insert one successfully. With an anteverted uterus and a cervix pointing posteriorly, this method of application can be easily mastered so that no spillage occurs. This is not true in some cases in which (*a*) the uterus is retrodisplaced and the cervix points anteriorly in the long axis of the vagina or (*b*) the introitus and vagina are significantly small with an accompanying element of voluntary or involuntary spasm so that application cannot be made properly without much tilting and turning of the cap. In these cases a cap is used that has previously had a hole drilled through it directly beneath the rim. These caps are empty when fitted to the cervix, eliminating the problem of spillage during the application. The cap is then exposed with a vaginal speculum and rotated so that the hole is directly anterior. The semen specimen is drawn into a luer-lok® syringe through a 20-gage needle that has been specially prepared for injection of the semen into the cap. The distal third of the needle has been bent into a semicircle (fig. 3). This allows the needle to be slipped through the hole in the cap alongside the cervix without puncturing the cervix.

It is necessary to withdraw the air within the cap, allowing the air to rise above the level of the semen in the syringe before the semen is injected. After the injection, the needle is removed from the cap, the bottom of the cap is pressed lightly so as to make a tighter fit, and the cervix itself seals off the injection hole. Placing the injection hole immediately under the rim instead of in the bottom of the cap, as described by other workers, eliminates the necessity of covering the hole with beeswax.

All caps are allowed to remain in place for a minimum of eight hours and are usually removed within 16 hours. In repeated tests no living spermatozoa have been found in any of the caps after eight hours with the cap in place. Samples of intracervical mucus, taken at the eight-hour limit, have almost always shown multiple viable spermatozoa.

RESULTS AND COMMENT

It can be conservatively presumed that an optimal capping schedule occurred with each patient on the average of two out of three cycles. Arbitrarily it was decided to include in this series of couples only those credited with a minimum of five cycles involving capping, unless, of course, success occurred with an earlier capping. It was felt, conservatively, that each couple selected for analysis would therefore have had at least three out of five chances of optimal insemination. This decision was influenced, as will soon be shown, by the occurrence of all but two successes in five or less capping cycles. A failure in Whitelaw's series of 32 patients was defined as lack of conception after 13 cycles of capping. However, the basal body temperature chart was used for indication of ovulation in his series rather than the more accurate vaginal smear technic.[8]

TABLE 1.—*Fifteen Cases of Primary Sterility with Oligospermia*

Duration of Sterility	No.	Conceived	Aborted	Failures
1½-3 yr.	5	5	1	0
3-5 yr.	7	3	0	4
5-8 yr.	3	2*	0	1
Totals	15	10	1	5

* An intensively treated couple with a seven-year sterility problem with marked oligospermia who achieved conception twice by capping and is considered as two separate units.

In the present series, a total of 27 cases have been studied. Without exception all couples had been sterile for a minimum of one and one-half years, and 14 (52%) had been sterile for three or more years before the first capping was attempted. In 15 (56%) couples, at least one of the partners was 30 or more years of age, and both members of the family were 30 or over in 9 cases (33%) at onset of capping. Oligospermia was present per unit volume (no total volume exceeded 4.5 cc.) in 19 (70%) husbands. Basal metabolic rates on the negative side of zero were recorded in 23 (85%) husbands and 22 (81%) wives, and in both partners in 19 (70%) cases. Ten (37%) wives showed sex hormone deficiencies, as judged by vaginal smears and endometrial biopsy. Nine (33%) wives had conceived prior to capping either during or before the present marriage.

Of the 27 couples in the over-all series, 15 presented problems of primary sterility with deficient semen as the essential feature. These fifteen constitute by far the most

6. The plastic cap and the neutralizing material for douches (nutri-sal® and nutri-disc®) were supplied by Dr. Katherine Kuder and the Ortho Pharmaceutical Corporation.

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significant group of the study. Results of insemination procedures in these patients yielded 10 (67%) pregnancies (table 1), one of which terminated with abortion.

Comparison of these results with those of any other series comprising a similar group of couples and undergoing all other methods of therapy is indeed striking. Intensive management of male infertility, including desiccated thyroid and other hormonal therapy, has failed to yield results even remotely comparable to the 67% salvage obtained in this short series. This fact becomes even more significant when it is noted that nine of the 10 successes involved sperm counts ranging below 30 million per cubic centimeter, with seven of these below 15 million per cubic centimeter. Careful analysis of the 15 couples of this group shows that all had been the subjects of intelligent and adequate infertility management and therapy before the first fitting of the cervical cap. Twelve had been seen by other physicians with the chief complaint of inability to conceive before being included in the present study. Whitelaw's series of 32 couples who had been married two years or longer without a pregnancy showed a 37% salvage by the capping technic.

Fig. 2.—The cervical cap properly fitted to the cervix.

During the period of time covered by the present study, four additional cases of infertility without prior conception but with marked oligospermia came to us for management. Multiple semen analyses on each of the husbands showed sperm counts in every instance well below 30 million per cubic centimeter. Two ranged between 5 and 10 million, one between 10 and 15 million, and one between 20 and 25 million per cubic centimeter. All exhibited poor initial motility before thyroid and vitamin B complex therapy was started, and one, on repeated examinations showed 40% to 50% abnormal morphological forms. The duration of sterility in these couples ranged from one to eight years. Yet, during the two to four month intensive program of initial management and therapy preceding anticipated insemination of the husband's semen by capping, all four female partners became pregnant. Two of the four conceived a few days after hysterosalpingography. These cases serve to emphasize the absolute necessity for complete evaluation and thorough treatment of any barren couple before one resorts to use of the cervical cap, if one is to be reasonably objective in evaluating the clinical results obtained from the capping technic.

The use of the cervical cap is certainly of equivocal import in problems of secondary sterility, i. e., couples presenting a history of conception without the aid of insemination procedures prior to the present period of infertility. Nine such couples in the over-all capping series fall into this category. Additional diagnoses of oligospermia were made in four cases in this group (J. C., M. G., R. M., and E. T.), and in two of these four (J. C. and M. G.), pregnancy ensued concomitantly with the employment of the cap. This may be significant but remains a clouded issue, owing to absence of knowledge regarding the state of the semen at the time of the first conception. The importance of this prior knowledge is accentuated by the report of Falk and Kaufman,[5] who showed 15% of the subjects in their random series of normally fertile men to have a sperm count of less than 60 million per cubic centimeter. These workers belittle the importance attached to oligospermia per se and stress abnormal morphology and poor motility and longevity as the outstanding features in male infertility. Essentially, then, if the semen of these four men had been within normal limits at the time of the first conception and had since deteriorated, these two pregnancies would assume significance.

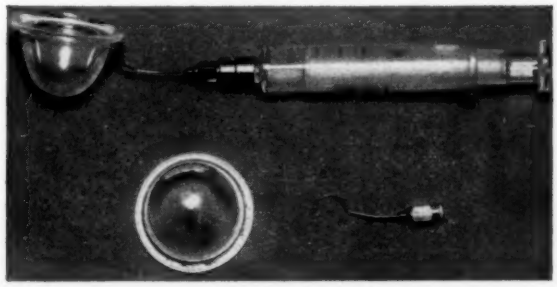

Fig. 3.—Equipment used in placing ejaculate in cervical cap through an injection hole after the cap has been fitted.

The remaining five secondary sterility cases (S. M., J. L., H. C., C. F., and A. H.) had associated normal semen specimens. In each of these the possible factor of residual damage to the endometrium was eliminated by adequate endometrial biopsy. Three couples (S. M., J. L., and H. C.) attained success with the cap, and two failed. Perhaps, in the cases of the three conceptions, the efficacy of the cap lay in speeding up the occurrence of fertilization that might have eventually taken place in the

course of proper clinical management. This is borne out by the development of pregnancy in one (C. F.) of the two cases in which capping failed five months after the last of nine cycles in which insemination was practiced. Although insemination had been regarded as of little value in this case and had been discontinued, a therapeutic regimen was still being followed by both partners at the time of conception.

In the same vein, reference must be made to one of the three couples with primary infertility problems without semen inadequacy that are included in the over-all capping series. Failure by the capping technic was recorded in all three, but one couple later conceived without aid of the insemination program. This occurred while the couple was on vacation but still adhering to a strict regimen of sterility management. This suggests the possibility of a significant role played by nervous tension. Vaginismus has been noted during capping procedures in particular, and infertility workers in general have made much of genital spasm in the female. Much attention has recently been focused on the psychic aspects of sterility, and certainly the unusual circumstances of insemination procedures, as compared with ordinary coitus, can initiate or intensify unusual emotional reactions which may, in turn, become manifest organically by localized muscle spasm and vascular congestion. In this respect it is also of interest to note that in four of the 15 oligospermic primarily infertile couples the male partner was a physician. In each of these cases the husband was taught to use the cap and insemination was practiced at home. All four wives, no longer subjected to the procedure in the confines of a professional environment under the management of persons other than their husbands, promptly became pregnant.

Summarizing the entire series, 15 (56%) pregnancies resulted in 27 couples in association with the use of the cervical cap (table 2). Oligospermia and inadequate semen were considered the prime contributing factors in 12 of these 15 successful cases. The remaining three cases, all of which were associated with semen specimens within the normal range, constituted problems in secondary sterility (table 3). If only couples with oligospermia are considered in the series, including both primary and secondary sterility cases, then an incidence of 12 (63%) pregnancies is recorded in a total of 19 couples. By the same token, if analysis is made only of those cases involving no history of prior conception, then 10 (56%) of 18 cases terminated with pregnancy.

From the information summarized in tables 1 and 2, it becomes obvious that, in accord with sterility studies in general, the incidence of successful pregnancy is approximately inversely proportional to the duration of the

TABLE 2.—*Results in Twenty-Seven Cases of Infertility*

Duration of Sterility	No.	Conceived	Aborted	Failures
1½-3 yr.	13	10	1	3
3-5 yr.	9	3	0	6
5-8 yr.	5	2*	0	3
Totals	27	15	1	12

* See footnote in table 1.

TABLE 4.—*Individual Successes*

Couple	V. C.	J. C.	E. M.*	S. M.	J. L.	A. M.	A. F.	R. M.	M. G.	H. C.	C. W.	M. M.	M. R.	E. M.*	W. W.
Previous conception	No	Yes	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	No	No
Duration of sterility	2	1½	7	2½	2	2	2	3	2½	2	4	1½	2½	7	4
Age of wife	25	28	34	25	36	30	24	30	29	28	29	28	27	35	25
Age of husband	26	47	34	29	43	33	29	30	30	27	29	28	29	35	30
BMR of wife	−2%	−4%	−14%	−16%	+8%	−17%	−25%	−15%	−13%	+3%	−20%	−21%	−16%	−14%	−22%
BMR of husband	−8%	−18%	−5%	−25%	+8%	−4%	−23%	−15%	−19%	−2%	−20%	−24%	−31%	−5%	−15%
Sperm count (millions/cc.)	50-60	15-20	5	70-80	120	25-30	20-25	10-15	50-60	60	5	7-15	5-10	5	10-15
Sex hormone deficiency in wife†	+	0	+	+	0	0	0	0	++	0	+	0	++	+	0
Cycles capped	11‡	3	2	3	2	3	3	2	1	2	7	5	3	1	2

* See footnote in table 1.
† As determined by vaginal smears and endometrial biopsy; + = progesterone deficiency and ++ = combined progesterone and estrogen deficiency.
‡ Aborted at two months.

TABLE 5.—*Individual Failures*

Couple	J. W.	D. S.	M. B.	E. S.	C. F.	R. P.	D. C.	M. S.	R. M.	A. H.	E. T.	H. W.
Previous conception	No	No	No	No	Yes	No	No	No	Yes	Yes	Yes	No
Duration of sterility	3	7	1½	7	5	3	3	5	2	1½	8	3
Age of wife	27	32	22	27	28	28	29	34	36	36	37	25
Age of husband	26	34	24	27	30	32	28	34	36	35	39	28
BMR of wife	−11%	+3%	−18%	−13%	−5%	−9%	−17%	+3%	−14%	−23%	0	−3%
BMR of husband	+5%	−6%	−11%	−23%	−19%	−13%	+4%	−21%	−11%	+1%	−16%	−2%
Sperm count (millions/cc.)	20	60-70	70	40-50	85-200	40-120	30-40	10-15	14-20	80-135	15-25	5-10
Sex hormone deficiency in wife*	0	0	0	0	+	0	+	0	0	0	+	0
Cycles capped	19	14	6	13	9	11	7	12	15	7	10	6

* See second footnote in table 4.

TABLE 3.—*Results of Insemination in Primary and Secondary Cases with Reference to Sperm Count*

Sperm Count (Millions/Cc.)	No. of Cases	Conceived		Aborted		Failures	
		Primary	Secondary	Primary	Secondary	Primary	Secondary
>60	8	0	3	0	0	3	2
50-59	2	1	1	1	0	0	0
40-49	1	0	0	0	0	1	0
30-39	1	0	0	0	0	1	0
15-29	6	2	1	0	0	1	2
5-14	9	7*	0	0	0	2	0
Totals	27	10	5	1	0	8	4

* See footnote in table 1.

sterility. With reference to the total series (table 2), of the 13 cases of one and one-half to three years' duration, pregnancy was achieved in 10, while of the 14 cases of three years' duration or more, conception occurred in only five. In the group of patients limited to oligospermic primary infertility (table 1), the five couples with only one and one-half to three years of sterility prior to capping achieved conception without exception, while the 10 couples with three years or more of sterility had five successes and five failures.

In the over-all group of 15 successful couples, 12 achieved conception in three or less cycles of capping (table 4). The remaining three, all with oligospermic primary sterility problems, attained success in 5, 7, and 11 cycles, respectively, the last terminating in abortion at two months. Thus it can be seen that success, when it was attained, occurred relatively rapidly in the majority of cases. The implication is obvious. Assuming that ovulation can be detected fairly accurately, the chances of pregnancy resulting in conjunction with the employment of the cervical cap become markedly decreased if success has not been attained before the fourth cycle of capping. This is borne out by the number of capping cycles credited to the failures in the complete series. Of the 12 unsuccessful couples, 11 or more cycles of capping were done in 8 cases and in 1 as many as 19 times (table 5). In three of the five cases of failure in the oligospermic primary infertility group, more than 11 cycles of capping were done.

CONCLUSIONS

1. The use of the cervical cap in primary sterility resulting principally from relative semen inadequacy is unquestionably indicated, but only subsequent to a period of thorough investigation and management.

2. The cervical cap in cases of secondary sterility is probably of considerable importance with especial regard to shortening the duration of infertility. Capping is not as valuable in secondary as in primary sterility problems.

3. The cervical cap is a useful adjunct toward solving the problem of the barren marriage, but it is far from a panacea. Unless all other factors are eliminated initially, the cervical cap will be misused. Since the actual process of capping according to schedule is extremely tedious to doctor and patient alike, it becomes almost mandatory that one precede any program of capping with adequate periods of diagnosis and therapy.

4. In any well-selected and well-managed series of patients subjected to the therapeutic regimen of insemination with the husband's semen by the cervical cap technic, pregnancy usually will occur early in the regimen, if it is to occur at all as a direct result of this treatment.

SUMMARY

The results of a study of a series of infertile couples subjected to the therapeutic technic of the cervical cap are presented. Of 15 cases of primary sterility with oligospermia, conception was achieved in 10 (67%). Fifteen (56%) pregnancies resulted in the entire group of 27 cases in which the cervical cap was employed.

630 S. Kingshighway Blvd. (10) (Dr. Grody).

NONTRAUMATIC CERVICAL DISLOCATIONS IN RHEUMATOID SPONDYLITIS

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and
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Although the occurrence of dislocations in peripheral joints affected with rheumatoid arthritis is well known, the fact that cervical spine subluxations may likewise complicate rheumatoid spondylitis has not been generally realized. Similarly, rheumatoid spondylitis has received only scant mention in the literature as a cause of spontaneous atlantoaxial dislocations, which have been repeatedly ascribed to cervical or nasopharyngeal inflammations in childhood, rheumatic fever, and tuberculosis of the spine. Ely [1] has reported atlantoaxial subluxation that occurred in a patient with rheumatoid arthritis. His patient, however, had a history of injury that may have precipitated the dislocation. More recently Stammers and Frazer [2] reported spontaneous subluxation of the atlas in a 30-year-old man who had a five year history suggestive of rheumatoid spondylitis, although this diagnosis was not mentioned. Rand [3] described a case of progressive subluxation of the atlas that caused a classic Brown-Sequard syndrome that was relieved by strong head traction followed by operative cervical fusion. Although this patient was known to have rheumatoid spondylitis with activity in the cervical region, the relationship of this disease to the subluxation was not recognized.

The following cases are reported to emphasize that lower cervical as well as atlantoaxial dislocations may occur in cervical spondylitis, and to increase awareness of these complications so that they may be recognized early and treated promptly.

CASE 1.—A 23-year-old white man entered the Cushing Veterans Administration Hospital on Sept. 21, 1948, with a history of rheumatoid spondylitis for the past three years. In 1945, while he was in Japan, stiffness and pain in the low back began that progressed gradually. He had also had intermittent pain in both knees. In 1946 he noted gradual onset of cervical pain and progressive rotation of his head to the right, which remained until entry. In the past year his pain had decreased, but the entire spine became stiff.

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Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

1. Ely, L. W.: Subluxation of the Atlas: Report of Two Cases, Ann. Surg. **54**: 20 (July) 1911.

2. Stammers, F. A. R., and Frazer, P.: Spontaneous Dislocation of the Atlas with Report of a Case, Lancet **2**: 1203 (Nov. 25) 1933.

3. Rand, C. W.: The Neurosurgical Patient: His Problems of Diagnosis and Care, Springfield, Ill., Charles C Thomas, Publisher, 1944, p. 47.

Examination revealed a rigid spine, with slightly increased upper dorsal kyphosis, and the neck fixed in slight extension, with the head rotated about 30 degrees to the right (fig. 1). On manipulation there was a slight feeling of "give" in the cervical spine, but no visible motion and fixed rotation. There was moderate spasm of the paravertebral muscles. Chest expansion

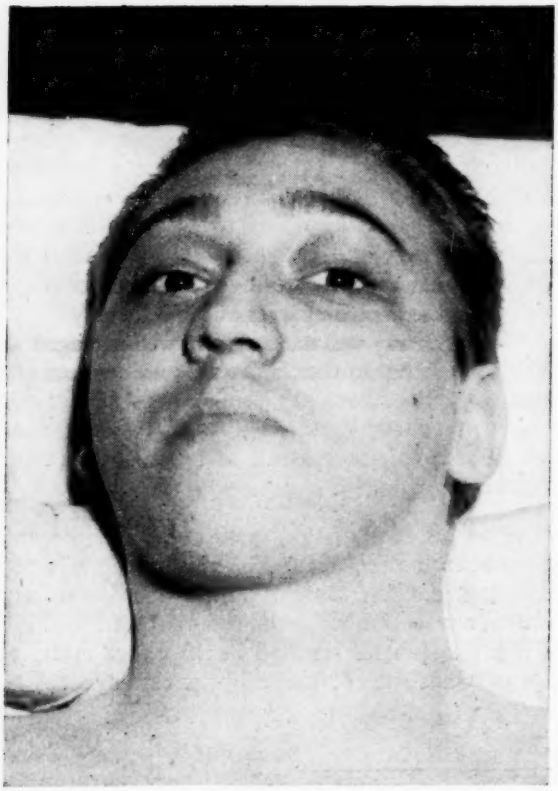

Fig. 1 (case 1).—Rotation deformity of neck in a patient with rheumatoid spondylitis.

was ½ in. (1.27 cm.). Results of laboratory tests were consistent with active rheumatoid arthritis.

Conservative treatment, consisting of bed rest, physiotherapy, and head traction by means of a Sayre sling, was unsuccessful in straightening the cervical rotation. A test of motion under thiopental (pentothal®) sodium anesthesia showed the deformity to be fixed.

In the lateral projection, roentgenograms of the cervical spine revealed (fig. 2) an abnormally wide space of 8 mm. between the anterior arch of the atlas and the odontoid process. The atlas was abnormally tilted, with elevation of its posterior arch producing an increase to 15 degrees (measured according to Coutts) of its angle of inclination to the axis. There was a well-marked forward position of the posterior atlantic arch. In the anteroposterior view (fig. 2) through the open mouth the left atlantoaxial joint space was obliterated, while the right was normal. These changes indicated a left unilateral dislocation of the atlas upon the axis.

All the other cervical articulations on roentgenograms showed varying degrees of irregularity and loss of definition of the articular surfaces, with poor outline of the joint spaces and regional osteoporosis. The joint spaces between the fifth and sixth segments were widened. The posterior longitudinal ligament was calcified. The findings were those of rheumatoid spondylitis. The lower lumbar articulations as well as the sacroiliac joints appeared fused on the roentgenograms, while the upper lumbar articulations showed changes of the same nature as those in the cervical spine. The lumbar paraspinal ligaments showed faint calcification. The dorsal intervertebral joints were not clearly visualized and no abnormalities were demonstrable.

In April, 1949, when it was recognized that the major part of the deformity was due to an atlantoaxial dislocation, the patient was placed in skull traction, employing Vinke tongs. His bed was placed on the right side of the ward, so that twisting motions of his head would be to the left. He remained in traction for four and one-half months, with a maximum pull of 42 lb. (19.9 kg.) for three and one-half months. No reduction of the dislocation was obtained, although subjectively the patient felt there had been a slight correction, judging by his field of vision.

Surgical attempts at correction were not deemed advisable, since the deformity was a unilateral dislocation at the atlantoaxial facet on the left, which allowed ample room for the spinal cord. At no time did the patient have any definite neurological symptoms or signs referable to the dislocation.

Case 2.—A 35-year-old white man was admitted with a complaint of neck pain radiating to both arms. There was a past history of progressive arthritis appearing seven years prior to entry in the lower back and hips. The present illness began eight months prior to admission, when he noted aching pain in the neck. Symptoms became severe enough to prevent his working some six months prior to admission. Four months prior to admission he was given a course of cortisone (cortone®) therapy at another hospital, at first intensively, with gradually diminishing doses; at the time of admission he was still receiving weekly injections of cortisone. Nevertheless, the patient noted persistent neck pain and x-ray examination disclosed an anterior subluxation of the atlas on the axis. Despite head halter traction and immobilization in a cervical brace, the patient two weeks prior to entry to this hospital had noted the onset of numbness and tingling in the arms and hands, which in the few days prior to entry extended to the lower legs and feet as well.

Physical examination showed a thin, chronically ill man with a stiff back and flexion deformity in the neck, with limitation of motion and marked muscle spasm. There was evidence in the upper extremities of loss of position sense and hyperactive reflexes. The blood sedimentation rate was 21 mm. per hour.

In the lateral projection, roentgenograms of the cervical spine revealed (fig. 3) anterior dislocation of the atlas upon the axis, as indicated by a marked forward position of both the anterior and posterior atlantic arches. The interval between the anterior arch and the odontoid process was 12 mm. The extreme forward position of the posterior arch demonstrated a high degree of encroachment upon the spinal canal. This marked displacement of the atlas and the absence of rotary neck deformity indicated that the dislocation involved the articular facets on both sides. The anteroposterior view through the open mouth showed no asymmetry in the position of these facets, and did not reveal the dislocation. Coutt's angle was not increased. The articulations

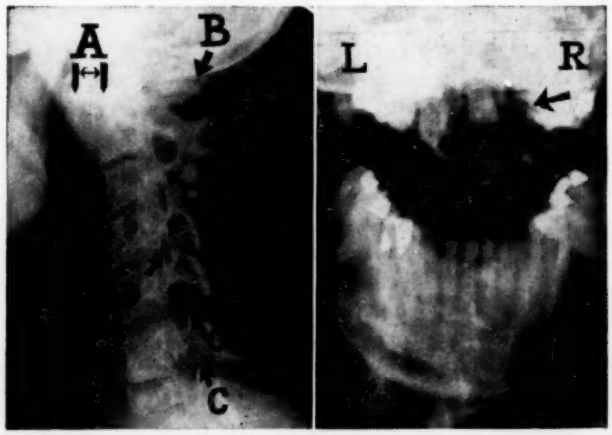

Fig. 2 (case 1).—On the left the atlantoaxial dislocation is shown on lateral view. There is an abnormally wide interval between the anterior atlantic arch and the odontoid process (*A*), and the posterior atlantic arch is elevated and in a forward position (*B*). Rheumatoid arthritic changes (*C*) and calcification of posterior longitudinal ligament (*D*) are also evident. On the right the anteroposterior view through the mouth shows that the right atlantoaxial joint space is normal (arrow) and the corresponding joint on the left is obliterated.

between the second and third cervical segments showed irregularity and loss of definition of the joint surfaces characteristic of rheumatoid arthritis. Similar changes were present in the

joints between the seventh cervical and first thoracic segments, but the other cervical articulations did not reveal any involvement.

The patient was placed in skeletal traction by means of wires placed through burr holes in the vertex. With the patient supine, 20 lb. (9.9 kg.) of traction was applied to the skull, and the

Fig. 3 (case 2).—Atlantoaxial dislocation revealed on lateral view. There is an abnormally wide gap between the anterior atlantic arch and the odontoid process (*A*). The posterior arch of the atlas encroaches on the spinal canal in its forward position (*B*), and rheumatoid arthritic involvement can be seen (*C*).

cervical region was hyperextended by a firm cervical pillow. Serial roentgenograms over the subsequent five days disclosed progressive reduction. Traction was continued for six weeks but was reduced gradually after the second week to 5 lb. (2.2 kg.) by the end of the sixth week. Symptoms disappeared and sensation returned. After removal of the traction wires, he was ambulatory wearing a Taylor back brace incorporating a jury mast to maintain the neck in extension. A posterior shell from head to hips was used at night.

At the time of this report, some eight months later, he was asymptomatic and roentgenograms demonstrate maintenance of the reduction. Clinically there was evidence of good rotatory motion through the atlantoaxial joints. A prolonged period of protection by means of the above-mentioned brace was contemplated.

Case 3.—A 31-year-old white man was admitted with complaints of anorexia, weight loss, weakness, and cervical and dorsal back pain. Symptoms had progresseed since onset four years before admission. Examination showed an emaciated young man with a thoracic kyphosis and rigidity and spasm of the neck, in a position of forward flexion and right rotation of 20 degrees. The entire dorsolumbar spine was rigid. The blood sedimentation rate ranged above 30 mm. per hour.

X-ray examination of the cervical spine (fig. 4) disclosed rheumatoid arthritic involvement of all the articulations, ranging from irregularity and narrowing of the joint spaces to incomplete fusion. There was a 2 mm. forward subluxation of the fifth cervical articulation on the sixth cervical, which was not recognized at that time. The patient was treated with salicylates, physiotherapy, partial bed rest, and intermittent light cervical traction by means of a head halter. Six months later a progressive increase in his cervical deformity was noted. He complained of radiating pain in the right shoulder and arm. Two weeks later he reported numbness and tingling in the arm and hand. No abnormal neurological signs were elicited. At this time repeat cervical roentgenograms (fig. 5) showed a 2 cm. forward dislocation of the fifth cervical on the sixth, with about 30 degress kyphotic and right lateral angulation and marked encroachment upon the neural canal. There was a very wide separation of the opposing subluxated articular surfaces of the posterior articulations at this level, bilaterally, revealing marked erosion of the superior facets of the sixth cervical.

Skull traction was instituted in the same way as in case 2. After 12 hours of 20 lb. (9.9 kg.) of traction roentgenograms disclosed a complete reduction of the dislocation with considerable distraction. Traction was decreased to 15 lb. (6.8 kg.) and the neck gradually extended, as in case 2. Roentgenograms, however, disclosed a reversal of the dislocation with the fifth cervical now nearly a centimeter posteriorly displaced on the sixth cervical. Resumption of the original flexed position was necessary, but in spite of this a moderate residual posterior displacement remained. For 12 weeks 10 lb. (4.5 kg.) of traction was maintained, following which the patient was made ambulatory supported by a brace similar to that used in case 2. A molded cervical collar was employed at night.

One year later roentgenograms showed minimal posterior displacement of the fifth cervical, with narrowing of the interspace between the fifth and sixth cervicals. The articular facets at this level appeared recalcified, with partial fusion of these joint spaces. Prolonged brace support was indicated, since it was felt

Fig. 4 (case 3).—Slight anterior dislocation of the cervical spine is shown, and there is forward subluxation fifth cervical on the sixth (*A*). There is subluxation of articular facets (*B*), and rheumatoid arthritic involvement of articulations (*C*).

that operative cervical fusion was dangerous in such a debilitated patient. His severe radiating pain disappeared completely during the first week of traction and did not return.

Case 4.—This 52-year-old man was examined for evaluation of the status of his long-standing generalized rheumatoid arthritis. There was a five year history of multiple joint pains.

For two years prior to examination he had noted stiffness of the neck and tingling paresthesias in both hands. No injury was recalled. There were no neurological abnormalities on physical examination, and further study was made impossible because the patient did not desire treatment or hospitalization.

X-ray examination demonstrated a 5 cm. forward dislocation of sixth cervical on the seventh cervical, which could be distinguished both at the bodies and at the facets (fig. 6). This dislocation appeared to be longstanding because of calcific bridging anteriorly across the interspace between these bodies. The articulations between the second, third, and fourth cervical segments showed rheumatoid arthritic involvement, with irregularity and narrowing of joint outlines. With the exception of the joints at the level of the dislocation, the other cervical articulations appeared normal.

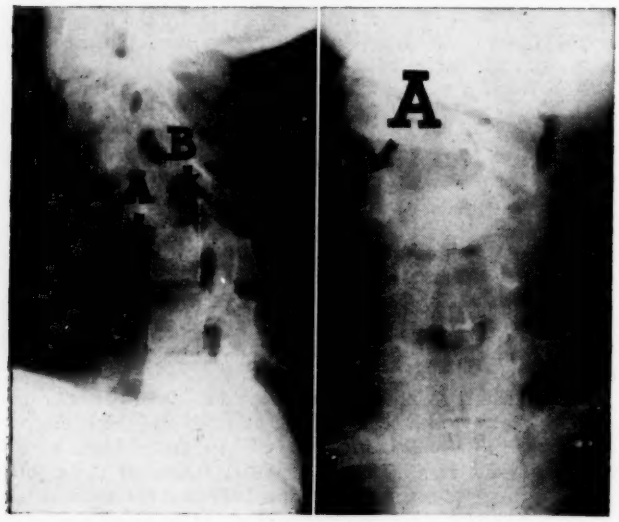

Fig. 5 (case 3).—Full development of the dislocation of the fifth cervical on the sixth. On the left in the lateral view marked forward displacement of the fifth cervical, with angulation and encroachment on the spinal canal, is seen (*A*). Subluxation with wide separation of articular facets and erosion of superior facets of the sixth cervical is evident (*B*). On the right the anteroposterior view shows angulation of the spine to the right (*A*).

COMMENT

The etiological factors involved in spontaneous cervical dislocations have been discussed in the literature mainly as related to the atlantoaxial joint. However, one can readily understand that the same pathological process occurs in other cervical articulations. Martin [4] has summarized the sequence of events in spontaneous atlantoaxial dislocation as follows: (1) cervical infection with hyperemia; (2) vertebral decalcification and loosening of ligamentous attachments; and (3) forward slipping of one or both lateral articular facets of the atlas. This sequence is in general agreement with that described by most authors. Jones [5] and others have emphasized the role of hyperemia in this dislocation. Coutts [6] and Berkheiser and Seidler [7] contended that the dislocation is preceded by distention of the capsules of the atlantoid joints, including relaxation of the transverse ligament. From all these observations one can fairly deduce that hyperemia, capsular distention, and ligamentous relaxation, such as may be present in active rheumatoid involvement of the cervical spine, are important etiological factors in spontaneous cervical dislocations. It thus appears that these dislocations occur during the active phase of the rheumatoid arthritis. It seemed clinically evident that our patients had active rheumatoid changes in their cervical spines at the time of subluxation. This is in accord with the views of Stammers and Frazer, who believe that the atlantoaxial dislocation in their patient took place during an active phase of arthritis. In the cases reported here the deformity of the neck due to the dislocation was insidious in onset. Similarly in Stammers and Frazer's case progressive rotation and increasing flexion of the head took place over a period of one year. This slow development of the dislocation may be an important factor in the prevention of serious spinal cord injury. The reason for this gradual progression, in contradistinction to the sudden onset usually present in atlantoaxial dislocations associated with nasopharyngeal infection, is not clear. Hess, Abelson, and Bronstein [8] suggest that constant spasm of the cervical muscles is the probable mechanism in the production and maintenance of subluxation.

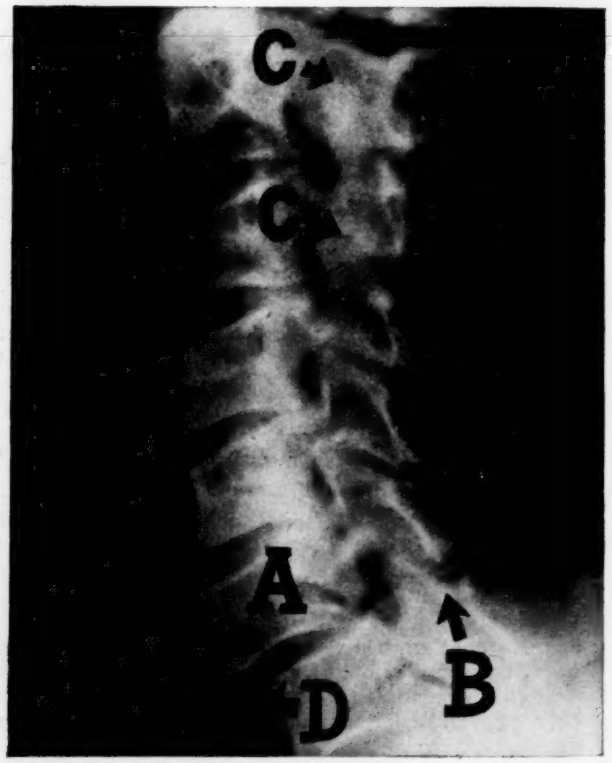

Fig. 6 (case 4).—Dislocation of the sixth cervical on the seventh. Anterior displacement of the body of the sixth cervical (*A*), subluxation of the articular facets (*B*), rheumatoid arthritic changes (*C*), and calcific bridging of the interspace (*D*) are evident.

While most of the reported cases of atlantoaxial dislocation occurred without clinical evidence of spinal cord compression, varying degrees of cord involvement have been mentioned, ranging from slight manifestations to quadriplegia. Generally no neurological symptoms are

4. Martin, R. C.: Atlas-Axis Dislocation Following Cervical Infection, J. A. M. A. **118**: 874 (March 14) 1942.

5. Jones, R. W.: Spontaneous Hyperemic Dislocation of Atlas, Proc. Roy. Soc. Med. **25**: 586 (Feb.) 1932.

6. Coutts, M. B.: Atlanto-Epistropheal Subluxations, Arch. Surg. **29**: 297 (Aug.) 1934.

7. Berkheiser, E. J., and Seidler, F.: Non-Traumatic Dislocations of the Atlanto-Axial Joint, J. A. M. A. **96**: 517 (Feb. 14) 1931.

8. Hess, J. H.; Bronstein, L. P., and Abelson, S. M.: Atlanto-Axial Dislocations, Unassociated with Trauma and Secondary to Inflammatory Foci in the Neck, Am. J. Dis. Child. **49**: 1137 (May) 1935. Hess, J. H.; Abelson, S. M., and Bronstein, L. P.: Spontaneous Atlanto Axial Dislocations: Possible Relation to Deformity of the Spine, Am. J. Dis. Child. **64**: 51 (July) 1942.

experienced in unilateral dislocations, as in case 1. In these instances, according to Hess, Abelson, and Bronstein,[8] the dislocations are rotary, with the odontoid process as the pivotal point. There is no reduction in size of the spinal canal and consequently no encroachment on the cord. In Stammers and Frazer's case spinal cord symptoms were present, but it is not stated whether the atlantoaxial dislocation was unilateral or bilateral. Recently Titrud and associates [9] reported on a patient with nontraumatic atlantoaxial dislocation with quadriplegia who recovered. Concerning cervical dislocations that are bilateral and extensive, as in cases 3 and 4, the importance of possible spinal cord injury must be emphasized. In these two patients the changes in neurological signs and symptoms during treatment were dramatic, the relief from radiating arm pain and paresthesia being the most outstanding.

The radiological evidence of atlantoaxial dislocation is quite definite. In the lateral view there is an abnormal forward position of the anterior arch of the atlas in relation to the odontoid, as stated by many authors. Normally the interval between this arch and the odontoid should not be more than 1 to 2 mm. The forward position of the posterior arch of the atlas in relation to that of the axis produces a definite angulation of the normally smoothly curved line drawn along the inner borders of the posterior cervical arches to the posterior lip of the foramen magnum outlining the posterior limits of the spinal canal. Furthermore in the lateral view there may be an abnormal inclination of the atlas, so that its posterior arch is brought away from that of the axis closer to the occiput. Coutts has stated that the upper normal range of the inclination of the atlas against the axis is 10 degrees. This angle is measured by a line joining the inferior borders of the anterior and posterior atlantic arches and a line joining the inferior border of the articular processes of the axis with the inferior border of its spinous process. The obliteration of the atlantoaxial joint space in the anteroposterior projection is considered to be the lateral mass of the atlas overlapping the articular facet of the axis. Berkheiser and Seidler believed that this obliteration is pathognomonic of unilateral atlantoaxial dislocation. However, Englander [10] and Coutts have stressed the fact that the overlapping may be normal during rotation and flexion of the head.

Dislocations occurring below the atlantoaxial joint are generally obvious if the malalignment of the cervical bodies is observed. Here one can visualize more clearly the subluxation of the corresponding articulations and the deossification in the articular facets. Follow-up studies may, as in case 3, indicate recalcification in these facets.

Many methods of treatment have been applied in cases reported in the literature. Manipulation under anesthesia, fixation in a plaster jacket, and head traction with sling or tongs have been tried with varying results. Jones [5] is of the opinion that fixation is unnecessary and inadvisable because it produces additional vertebral decalcification. He stated that dislocations of brief duration could be reduced by hyperextension under anesthesia, but he did not mention treatment in the long-standing cases. Generally in cases of long duration reported in the literature, treatment was unsuccessful and persistent fixed deformity resulted. Of the four patients described here, only in those who received early active treatment was the deformity corrected. The question of surgical fusion of the involved segments of the servical spine is still unsettled. The advantage of obtaining a rigid bony fixation to prevent any possible future recurrence of subluxation is obvious. However, in case 3 surgical fusion was strongly considered but was not done because of the patient's severely debilitated condition. This general debility is usually present in patients suffering from this disease. In addition, the results in cases 2 and 3 in which satisfactory correction of the dislocation was obtained have been most encouraging without surgical intervention. To this we must add the obvious fact that the over-all tendency of rheumatoid spondylitis is to produce fusion of the affected joints over a period of time.

SUMMARY

Spontaneous cervical dislocation may occur in the course of rheumatoid spondylitis and is of insidious onset, with progressive development of rotation and flexion deformities. The dislocation takes place during an active phase of rheumatoid disease, when hyperemia and capsular distention in the region of the cervical joints plus deforming muscle spasm are important causative factors. It is evident that when recognition is prompt, vigorous treatment in an early stage can prevent the fixed deformities resulting from such dislocations and relieve signs and symptoms of spinal cord compression.

9. Titrud, L. A.; McKinlay, C. A.; Camp, W. E., and Hannah, H. B.: Non-Traumatic Atlanto-Axial Dislocation: Report of a Case with Recovery After Quadriplegia, J. Neurosurg. **6**: 174 (March) 1949.

10. Englander, O.: Non-Traumatic Occipito-Atlanto-Axial Dislocation: Contribution to Radiology of Atlas, Brit. J. Radiol. **15**: 341 (Dec.) 1942.

Barbiturate Addiction.—The administration of barbiturates for long periods of time is a widespread medical practice, and undoubtedly addiction may follow. We are only beginning to appreciate the scope of the problem, and there is no precise information available. Some studies indicate there are more addicts to barbiturates than to morphine, and it is evident that barbiturate addiction is increasing every year.

In the past, it was considered that sedative drugs did not produce true addiction. There is enough information now available to show this hypothesis to be untrue. By any definition, the barbiturates are addicting, with psychic phenomena, tolerance, deterioration of the addict, and withdrawal symptoms. The latter may be of many forms. Convulsions are outstanding, but often the picture closely resembles delirium tremens. In other cases, withdrawal of the drug leads to yawning, nausea, restlessness, irritability, and so on, just as does withdrawal of morphine from a narcotic addict.

Many physicians, aware only of the sedative actions of barbiturates, cannot appreciate that the drugs also may produce a marked stimulation much desired by the addict. In many ways barbiturates act like alcohol. In fact, these two drugs may have synergistic effects. Many individuals develop a "talking jag" or other evidence of escape from inhibitions, particularly after taking one of the short-acting barbiturates. In still other cases the barbiturates may produce violent excitement, mania, delirium.—Walter Modell, M. D., Addiction as a Complication of the Therapeutic Use of Drugs, *New York State Journal of Medicine*, March 15, 1952.

PRESSURE TREATMENT OF MAXILLARY SINUSITIS

J. Mathews Robison, M.D., Houston, Texas

Therapeutic application of physical pressure to various parts of the body has been in use for many years. Pressure has been used to facilitate the healing of wounds, burns, fractures, and chronic ulceration of the skin and in skin grafting. Pressure has also been used to prevent hemorrhage, interstitial cavitation, edema, and accumulation and stagnation of excess interstitial fluid. Smith [1] was the first to apply pressure in the maxillary sinus with a balloon. He inflated a balloon in the sinus to apply pressure to and prevent edema in a skin graft in the sinus. Later Shea [2] inflated a balloon in the maxillary sinus to hold the walls of the sinus in position after reduction of a fracture.

METHOD OF TREATMENT

For several years I have treated certain types of maxillary sinusitis in selected patients by applying local pressure to the mucosa of one or both maxillary sinuses. I accomplished this by making a small opening into the maxillary sinus through the nasoantral wall under the inferior turbinate. This antrostomy is made close to the attachment of the inferior turbinate to the lateral nasal wall, and in or about the anteroposterior center of its attachment. Through this antrostomy a small balloon is inserted into the sinus and inflated with iodized oil. Iodized oil is used to inflate the balloon, not for its medicinal effect, but because its specific gravity is higher than the specific gravity of the sinal secretion. As the balloon is inflated it displaces the secretion in the sinus and produces pressure on the sinal mucosa.

The balloon used is made of natural rubber and is about 1 in. (2.5 cm.) in diameter before being deflated for introduction into the sinus. It is formed around the self-retaining deformable head of a no. 12 French rubber catheter. The balloons are manufactured with various sizes of self-retaining catheter heads inside the balloons. The various sized self-retaining heads inside the balloons are necessary to occlude properly the various-sized openings through which the balloons are inserted. The deformable self-retaining catheter head allows the balloon and catheter head to be inserted through an antrostomy that is only slightly larger than the shaft of the catheter. After the balloon is inserted into the sinus, the deformable catheter head re-forms. As the balloon is inflated it produces pressure on the sinal mucosa and the catheter head occludes the antrostomy and prevents the balloon from herniating into the nasal cavity.

To insert the balloon through the antrostomy into the sinus, it is useful first to inject through the catheter into the balloon about 1 cc. of jelly lubricant. This allows the inside surface of the balloon to adhere and remain deflated during its introduction. An obturator with a curved tip is introduced into the catheter head, and the head is deformed by traction on the catheter. The deflated balloon is draped symmetrically around the catheter head, the outside of the balloon is lubricated, and the balloon is inserted through the antrostomy into the sinus. To inflate the balloon, a 10 cc. syringe containing 7 cc. of iodized oil is attached to the catheter, and the plunger is withdrawn to exhaust any air remaining in the balloon. If sinal secretion or blood is aspirated into the syringe, the balloon has been punctured and another balloon will have to be inserted.

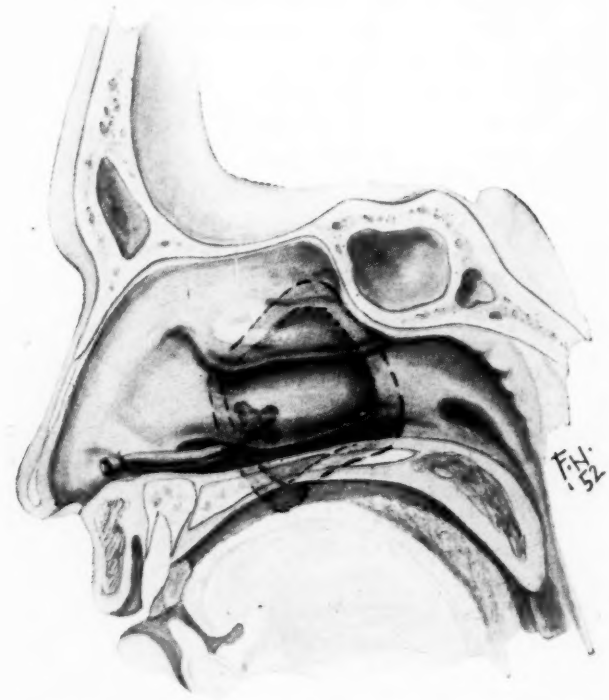

Fig. 1.—Drawing showing the balloon and catheter in place in the maxillary sinus. The balloon is inserted into the maxillary sinus through a small antrostomy made through the nasoantral wall under the inferior turbinate. The antrostomy should be only large enough to allow the balloon and its contained deformed catheter head to be inserted into the sinus. As pressure is applied by injection of iodized oil into the balloon the reformed catheter head occludes the sinal side of the antrostomy and prevents herniation of the balloon into the nasal cavity. The balloons are manufactured with various sizes of self-retaining heads to fit various-sized openings. Immediately after the balloon is inserted and inflated, it is spherical. A few weeks later, after the iodized oil with which the balloon is inflated has reduced the elasticity and contractility of the rubber, the balloon adapts itself to the irregular contour of the sinus, thereby producing slight uniform pressure on the edematous sinal mucosa. The catheter is cut off and tied so that its nasal end rests about the mucocutaneous junction. The catheter is tied with a double strand of no. 9 braided silk, with the knot on the side of the catheter opposite the nasal septum. The balloon usually remains in the sinus for about three months and may be reinserted if indicated.

Only enough iodized oil is injected into the balloon to create a comfortable sensation of fulness or pressure in the sinus. The catheter is tied with a cord in the nasal vestibule so that the knot is on the side of the catheter away from the nasal septum. The catheter is cut off so that its intranasal end lies inconspicuously in the nasal

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The drawings for this article were prepared by Mr. George W. Newman and Mr. F. W. Schmidt and their associates in the Department of Medical Illustration, University of Texas School of Medicine, Galveston, Texas.

1. Smith, F.: Plastic Surgery; Its Interest to the Otolaryngologist, J. A. M. A. **75**: 1554 (Dec. 4) 1920.
2. Shea, J. J.: Management of Fracture Involving Paranasal Sinuses, J. A. M. A. **120**: 745 (Nov. 7) 1942.

vestibule at the mucocutaneous junction. The cavity of the normally developed maxillary sinus often is shaped like a truncated pyramid, or it may be an irregular oval or contain partial septums. Rarely is it round like a balloon, so that a balloon can make pressure equally and simultaneously on the mucosa, covering all of its walls. For this reason a round balloon cannot completely fill an irregular cavity without producing more than comfortable pressure on parts of the walls of the sinus. However, after the iodized oil has been in contact with the inside of the rubber balloon for a period of time, the rubber gradually loses most of its elasticity and slowly conforms to the irregularities of the sinal cavity.

RESULTS AND PATHOLOGICAL PROCESSES INVOLVED

Most of the patients who have had balloons inserted into their maxillary sinuses have worn them for two or three months. Some, particularly those with primary purulent sinusitis, have had good results in a shorter period of time. In those patients who are particularly susceptible to recurrent infection and have allergic sinusitis, nasal polypi, and bronchial asthma of long duration, it is sometimes necessary to insert the balloons two or three times, at intervals of a few months, before a lasting cure is obtained. After the balloons have been removed from the sinuses, the patient is given any indicated treatment, such as injection of antigens, vaccines, or nonspecific protein. If antigens are injected while the balloons are in the sinuses, the dosage should be reduced to avoid giving the patient asthma.

One removes the balloon by cutting the string from around the catheter and aspirating the oil from the balloon through a curved cannula passed through the catheter into the self-retaining head. Traction is made on the catheter, and a curved hemostat is passed into the antrostomy, where the balloon is grasped and removed.

The application of local pressure to the mucosa of the maxillary sinus was designed primarily to promote absorption of the excess interstitial fluid present in the sinal mucosa during allergic sinusitis. The principal characteristics of the pathological condition present in the sinal mucosa during primary allergic sinusitis are eosinophilic infiltration and edema. These pathological processes may resolve spontaneously after acute allergic rhinitis and sinusitis, or they may persist; as the excess interstitial fluid becomes stagnant, it may become susceptible to recurrent viral or bacterial infection.

During development of the pressure treatment of allergic sinusitis, it became evident that, when allergic sinusitis with secondary infection was being treated, the symptoms and signs of the secondary infection were the first to subside. This observation instigated the pressure treatment of primary purulent sinusitis, which has proved to be very effective.

To understand better the therapeutic indications and effects of the application of physical pressure to the mucosa of the maxillary sinus, we should consider briefly some of the fundamental principles of the physiological and functional pathological factors related to the application of pressure to the sinal mucosa. The mucosa of the normal maxillary sinus is seldom more than 0.02 mm. in thickness [3] and, when normal, is a nonabsorbing membrane. However, after the mucosa reacts to irritation or infection by becoming edematous, its interstitial spaces are "open"; it readily absorbs certain substances that may come in contact with its surface or that may be injected into its stroma. If the edema of the sinal mucosa persists and the interstitial fluid becomes stagnant, antigens or their conjugates derived from inhalation, ingestion, or injection may accumulate in the interstitial spaces of the sinal mucosa. This partly accounts for the persistence of the edema of the sinal mucosa that is characteristic of allergic sinusitis. During the allergic state, allergens tend to produce their acute and sudden local tissue reactions in the areas of the body that have the least tissue pressure.[4] These are the same areas that become edematous first during hypoproteinemia, i. e., skin, subcutaneous tissue, and mucous membrane. The mucosa of the maxillary sinus probably has the least tissue pressure of any of the tissues of the body, because it is the first or one of the first tissues to become edematous during lowering of the colloidal osmotic pressure of the blood plasma such as is seen in hypoproteinemia.

The normal sinal mucosa must possess the following three characteristics to perform its necessary functions:

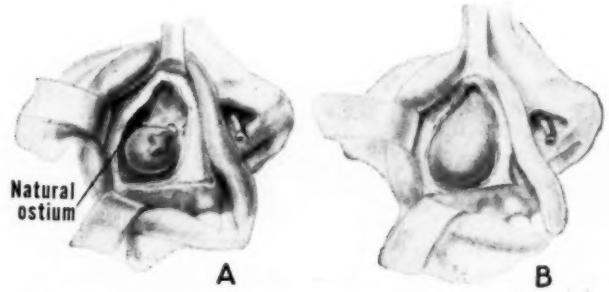

Fig. 2.—Drawings showing an approach through the anterior sinal wall as an aid to insertion of the balloons. In certain conditions due to developmental irregularities, such as a thick nasoantral wall or intrasinal septums, or in pathological conditions such as complete filling of the sinus with polypi, it is necessary to facilitate the insertion of the balloon by an approach through the canine fossa as in diagram *A*. The opening through the fossa rarely is made as large as is shown in the diagram. It should be only large enough to allow removal of the larger intrasinal polypi or other obstruction. The sinal mucosa should not be removed completely. Diagram *B* shows the balloon inflated with iodized oil and filling the sinus. Usually the balloon is not inflated to the extent shown until it has been partially inflated for several weeks.

1. Its sinal surface must be covered with epithelial cells having active cilia. 2. Its glands must be able to secrete sufficient mucus to provide a constant cover over the cilia. 3. It must be capable of becoming edematous and of swelling until it approximates or entirely fills the sinus.[5] This latter function is important during pathological states because, by becoming edematous, the sinal mucosa increases its tissue pressure as it swells against its inherent contractility and the unyielding bony walls of the sinus.

Some of the factors that govern the production, distribution, and absorption of extravascular fluid are (1) colloidal osmotic pressure of the blood plasma, (2) arterial

3. Piersol, G. A.: Normal Histology, with Special Reference to the Structure of the Human Body, Philadelphia, J. B. Lippincott Co., 1892, ed. 2, p. 403.

4. Robison, J. M.: A Method of Preventing Contact Conjunctivitis, Am. J. Ophth. **33**: 964 (June) 1950.

5. Robison, J. M.: Management of Allergic Sinusitis, Instructional Course, Annual Meeting of American Academy of Ophthalmology and Otology, Oct. 14-18, 1951.

capillary pressure, (3) venous capillary pressure, (4) hydrostatic pressure, (5) atmospheric pressure, (6) tissue pressure, and (7) physical pressure. Of these factors, those that are particularly important to the problem of promoting absorption of excess interstitial fluid from the sinal mucosa are colloid osmotic pressure, tissue pressure, and physical pressure.

The variables of colloidal osmotic pressure are (1) time, (2) membrane area, (3) difference in concentration of the colloid across the membrane, (4) size of the diffusing molecules, (5) temperature, and (6) physical pressure.[6] Of these variables, those that can be used best to promote absorption of edema fluid are time and physical pressure.

The application of physical pressure to the mucosa of the maxillary sinus is designed primarily to support or increase the tissue pressure of the sinal mucosa.

The variables that are important to tissue pressure are as follows (taken in part from Drinker[7]):

1. Tissue pressure is gaged by the resistance a tissue offers to distension of its interstitial spaces by edema fluid.

2. Tissue pressure according to its magnitude resists capillary filtration and promotes capillary absorption and lymph flow.

3. Tissue pressure is related to the contractility and density of the tissue and increases as the interstitial spaces become filled with newly formed fibroblasts.

4. Tissue pressure may be increased by application of physical pressure to the surface of the part.

The constantly changing pericellular environment of the cells of the body is maintained by arterial capillary filtration, venous capillary absorption, and lymph flow. Lymph flows normally in parts of the body by active and passive motion, muscle contraction, massage, gravity, and tissue pressure. The nose and paranasal sinuses, when normal, are deprived of muscle contraction to promote the flow of lymph and must depend chiefly on gravity and tissue pressure.[8] During pathological states, if the tissue reaction is severe, all air-containing cavities of the body have the air replaced by secretion and/or edematous tissue. This facilitates lymph flow by allowing arterial pulsations to be transmitted to the lymph vessels by hydrostatic pressure through an incompressible fluid medium. This is accomplished in the sinuses during pathological states by the sinal mucosa's becoming edematous and approximating the capacity of the sinus. As this occurs the swelling of the sinal mucosa facilitates drainage of the sinus by forcing the sinal secretion to the region of, or through, the ostium of the sinus.

To understand better how a balloon that is inserted into the maxillary sinus and inflated with iodized oil aids or supplants the pathological behavior of the sinal mucosa, one should consider briefly the pathological changes present in the sinal mucosa during primary purulent sinusitis, primary allergic sinusitis, and allergic sinusitis with secondary infection.

6. Davson, H., and Danielli, J. F.: The Permeability of the Natural Membranes, New York, Macmillan Company, 1943.

7. Drinker, C. K., and Yoffey, J. M.: Lymphatics, Lymph and Lymphoid Tissue: Their Physiological and Clinical Significance, Cambridge, Mass., Harvard University Press, 1941.

8. Robison, J. M.: Lymph Pump Mechanism of Nose and Paranasal Sinuses, Laryngoscope **60**: 489 (May) 1950.

9. Robison, J. M.: Pressure Treatment of Purulent Maxillary Sinusitis, Texas State J. Med. **47**: 281 (May) 1951.

During primary acute purulent sinusitis the secretion passes through the catarrhal, serous, purulent, and mucoid stages characteristic of purulent infection of mucous membranes. If during the course of the infection the cilia or mucus glands of the sinal mucosa fail to function properly or if the sinal mucosa does not swell sufficiently to force the secretion to the region of, or through, the ostium, the secretion is retained, resolution of the infection is delayed, and the subacute and chronic stages of the disease may ensue. After retention of highly proteinized secretion in the sinal cavity and highly proteinized fluid in the stroma of the sinal mucosa, newly formed fibroblasts appear in the stroma of the sinal mucosa. This fibrosis during prolonged purulent sinusitis usually is uniform throughout the stroma; if it is extensive, it interferes with the blood supply to the cilia and mucus glands and leads to the formation of a septic sinal cavity.[9]

COMMENT

Acute purulent maxillary sinusitis or any acute inflammation in the nose or sinuses is a definite contraindication to the application of local pressure to the sinal mucosa. During the subacute and chronic stages of purulent maxillary sinusitis, resolution of the infection usually is prompt and complete after the application of pressure to the sinal mucosa unless extensive irreversible pathological changes are present. The degree of reversibility of the sinal pathological changes may be determined partly by biopsy. However, a useful clinical criterion is observation of the amount of mucus present in the secretion as irrigation of the sinus is repeated. Usually, if the sinal mucosa can secrete a reasonable amount of mucus, the pathological changes are not completely irreversible. This criterion cannot be used for certain infections caused by gram-negative organisms, because these frequently suppress the secretion of mucus almost completely, although the blood supply to the mucus glands is good.

Pressure has been applied in most of the patients treated for purulent maxillary sinusitis for 8 to 12 weeks. Evidence is accumulating that a shorter period of application may be effective in certain patients who have had infection for a short period of time. Usually patients who can be greatly improved by an intranasal antrostomy alone can be cured completely by insertion of a balloon through the antrostomy and production of pressure on the sinal mucosa. In most patients the application of pressure in the sinus produces a more prompt and complete cure of subacute and chronic purulent sinusitis than the Caldwell-Luc or other radical maxillary sinus operation. Normal transillumination and normal ciliary action usually are restored to the maxillary sinus after the application of pressure, whereas these qualities rarely follow radical maxillary sinus operation. One should apply pressure in the maxillary sinuses of most patients with subacute or chronic purulent maxillary sinusitis in an effort to effect a cure before advising radical operation. Often it is surprising how a sinus that has contained pus for many years will apparently return to normal function and transilluminate normally after the application of local pressure to the mucosa.

Relief or cure of the bronchopulmonary symptoms of cough and bronchitis may occur simultaneously with re-

moval from the sinuses of the reservoir of secretion that had been draining into the trachea and bronchi. When bronchiectasis has developed as a result of drainage from the sinuses, usually it is necessary, in addition to curing the sinuses, to make repeated bronchoscopic examinations and aspirate the secretion from the involved bronchi to promote resolution of the bronchial infection. Some of these patients have gained 20 to 35 lb. (9 to 13.5 kg.) and have been able to avoid segmental lobectomy. Some of the structural changes in the bronchi, such as dilatation and sacculation, may remain in the bronchi, but if infection is not present, the patient may have no symptoms. This excellent relief from bronchiectasis is not as likely to follow the radical maxillary sinus operation as it is to follow the application of pressure in the maxillary sinuses. When purulent maxillary sinusitis is cured by the application of pressure, the cure is practically complete and there is no excess secretion draining into the bronchi. However, only too often after the radical maxillary sinus operation the cure is incomplete and there remains a slight continuous drainage into the bronchi that may be just enough to continue the bronchiectatic process.

Allergic sinusitis is a disease of the sinal mucosa that occurs in sensitized persons owing to inhalation, ingestion, or injection of certain antigens into the body. The primary pathological process present in the sinal mucosa is edema of the stroma, which may occur episodically or perennially. The edema may be transitory and disappear rapidly after exposure to the antigen, or the excess fluid may remain in the interstitial spaces, become stagnant, and render the sinal mucosa susceptible to recurrent infection. Allergic edema of the sinal mucosa often is accompanied by allergic rhinitis, tracheitis, bronchitis, and bronchial asthma. Allergic sinusitis is always a bilateral disease, but localization of secondary infection in one or more sinuses may cause it to appear to be unilateral. Eosinophils usually are found in the secretion in the sinuses and respiratory tract during acute allergic states, but they may disappear or almost disappear during secondary infection. Allergic sinusitis often resolves spontaneously. However, if an antigen or some of its products enter the sinal mucosa and remain there, they may produce persistent edema that is the beginning of a cycle of recurrent infection and progressive pathological changes in the sinal mucosa, characterized by the formation of alternating areas of fibrosis and dilated interstitial spaces.

As infection occurs in this type of mucosa and the tissue pressure rises, polypoid protrusion of the portions of the sinal mucosa that contain the dilated tissue spaces project into the sinal and nasal cavities.[10] Progressive polypoid degeneration of the sinal mucosa may occur until the maxillary sinuses and nasal cavities become entirely filled with mucous polypi. Apparently filling of these cavities with polypi is nature's method of increasing the tissue pressure of the sinal mucosa in an effort to maintain the constantly changing pericellular environment for the cells of the mucosa. Also, filling of the sinuses and nasal cavities with polypi prevents entrance of the inhaled antigens.

Application of pressure to the sinal mucosa during allergic sinusitis is most efficient during the early stages of the edema of the mucosa, before extensive polypoid degeneration has occurred. Acute allergic sinusitis, like acute purulent sinusitis, is a contraindication to the application of pressure. If the acute stage fails to resolve and the sinal mucosa remains edematous, the patient may manifest increased susceptibility to infection by frequent attacks of purulent sinusitis and tracheobronchial infection. Certain patients will have hay fever, bronchial asthma, and acute allergic sinusitis simultaneously. After the hay fever has subsided, the asthma and sinusitis may persist. These patients should be treated for their allergy by medication and desensitization. Also, it may be necessary to treat the sinusitis by irrigation of the sinuses. If the asthma subsides promptly after irrigation of the maxillary sinuses, application of pressure in the maxillary sinuses probably will effect cure or relief of the asthma.

Patients with a high eosinophil level in the blood and asthma should have their sinuses irrigated repeatedly, and all measures should be used to bring their asthma under control before pressure is applied in their sinuses. If this is not done, the patient may go into immunologic shock within 24 to 48 hours after insertion of the balloons. An internist or general allergist should always be in consultation with the otolaryngologist during the management of patients with allergic sinusitis and severe asthma. After all the more conservative measures have been used and the edema in the sinal mucosa persists, pressure should be applied to remove the edema of the sinal mucosa and prevent the progressive pathological changes that follow in the wake of recurrent secondary infection.

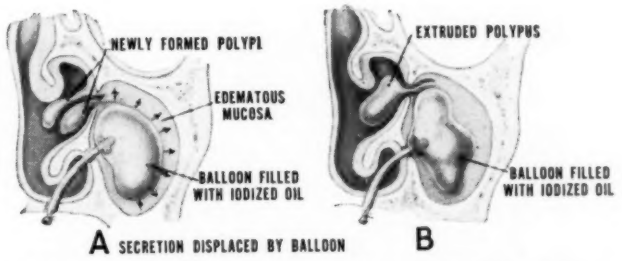

Fig. 3.—Drawings showing the physical effects of application of pressure to the edematous mucosa of the maxillary sinus. Diagram *A* shows the mechanism of production of newly formed polypi in the middle meatus as pressure is exerted on the edematous sinal mucosa. This mechanism is similar to the formation of polypi in the middle meatus following an acute inflammatory process in the maxillary sinus. If the ostium of the sinus is sufficiently large to allow herniation of the mucosa, intranasal polypi will form as the mucosa becomes edematous and approaches the capacity of the sinus. The arrows indicate the direction of the lines of force exerted by the balloon and the lines of force exerted by the inherent contractility of the previously normal but recently edematous sinal mucosa. Diagram *B* shows a polypus that was present in the maxillary sinus previous to insertion of the balloon. The polypus is being forced into the middle meatus. This type of polypus differs histologically from a recently formed polypus and may become strangulated. It may be removed without disturbing the balloon.

The patient should not have pain in the sinal area at any time while wearing balloons in the maxillary sinuses. Exceptions to this are the pain that may be caused by irritation of the nasal septum or vestibule by the tip of the catheter and the pain, which should be of short duration, that occurs immediately after the balloon is filled with oil or after oil is added. The latter type of pain usually

10. Robison, J. M.: Pressure Treatment of Allergic Sinusitis, Arch. Otolaryng. 45: 405 (April) 1947.

subsides as soon as the balloon displaces the secretion in the sinus. Each time oil is added to the balloon the patient should remain under observation until the sinal area is entirely comfortable or until there is only a slight sensation of fulness. In certain instances, one may have to remove marked irregularities of the nasal septum to gain access to the inferior meatus. Septal spurs and ridges, if prominent and placed anteriorly, may become ulcerated by pressure of the catheter.

As pressure is applied to the edematous sinal mucosa, the interstitial fluid is forced in the direction of the least resistance, which is toward the ostium of the sinus. As this occurs, folds or newly formed polypoid protrusions of the sinal mucosa may appear in the nasal cavity in the middle meatus and produce nasal stenosis. Also, well-formed polypi present in the sinus may be forced through the ostium and prolapse into the middle meatus, where they may become strangulated. These polypoid protrusions should be removed any time they become prominent. Care should be taken to avoid grasping the balloon during removal of these polypi, for occasionally the balloon also may herniate through a large sinal ostium.

In accepting patients for treatment who have advanced allergic sinusitis, nasal polyposis, bronchial asthma, reduced vital capacity of the lungs, pulmonary emphysema, pulmonary hypertension, chronic bronchitis, and bronchiectasis, one should impress on them that application of pressure to the sinal mucosa may not be a rapid or quick cure for all of their symptoms. It is important that they know that it may be necessary for them to be under observation, with intermittent periods of treatment, for two or three years. With this understanding, they are gratified if they obtain complete relief from their symptoms in a few months and are cooperative if they find that it is necessary for them to have the balloons reinserted two or three times. Treatment during this period should include in addition to the application of pressure, desensitization to antigens and measures designed to increase the patient's resistance to respiratory infections.

SUMMARY

1. Application of local pressure to the mucosa of the maxillary sinus is accomplished by insertion into the maxillary sinus of a self-retaining catheter with a balloon formed around its deformable, self-retaining head. The balloon is inserted through a small intranasal antrostomy made under the inferior turbinate and is inflated with iodized oil. The oil does not contact the sinal mucosa and is not used for its medicinal value. Iodized oil is used because it is heavier than the sinal secretion and, as it distends the balloon, it displaces the sinal secretion and exerts slight pressure on the sinal mucosa.

2. The application of pressure in the maxillary sinus is contraindicated during any acute inflammatory reaction in the nose or sinuses, particularly acute purulent rhinitis or sinusitis, acute allergic rhinitis or sinusitis, seasonal hay fever, and acute uncontrolled bronchial asthma and particularly if the condition is associated with a high eosinophil level of the blood.

3. Application of pressure in the maxillary sinus is indicated and has been used with excellent results during subacute and chronic purulent maxillary sinusitis and subacute and chronic allergic sinusitis, and it has relieved and apparently cured certain patients with allergic rhinitis, sinusitis, and bronchial asthma.

4. Application of pressure in the maxillary sinus reduces the susceptibility of the sinus to recurrent infection and, when combined with bronchoscopic drainage of bronchiectatic areas in the lungs, has resulted in cure of the bronchiectasis. This procedure does not restore the dilatation and sacculation of the bronchi to normal, but, when there is no drainage from the sinuses and no infection in the bronchi, the structural changes in the bronchi produce no symptoms.

5. Application of pressure in the maxillary sinus does not cure all types of maxillary sinusitis, e. g., pansinusitis and dentigerous sinusitis in certain advanced cases, but, when it is effective, it produces a more thorough cure and restores the sinus nearer to normal than any other operation.

6. It appears that application of pressure in the maxillary sinus produces better results in selected patients with sinusitis than the Caldwell-Luc or other radical maxillary sinus operation. After the application of pressure, normal transillumination and normal ciliary action usually are restored to the sinus and the volume and character of the secretion from the sinus is, or approaches, normal. Only rarely does the radical maxillary sinus operation achieve this favorable end-result.

7. When the physicians become more familiar with the application of pressure to the mucosa of the maxillary sinus and the indications and contraindications for its use are defined better, it appears that the application of pressure may replace the radical maxillary sinus operation except in certain selected cases in which there are irreversible structural or pathological changes in the maxillary sinuses.

1304 Walker Ave. (2).

The Electrocardiogram.—In the final analysis the electrocardiogram, like other clinical data, is interpreted empirically. It is as good as the judgment of the interpreter.

Any kind of electrocardiogram may be normal in a person under 30 years of age. After the age of 70 almost any change in the electrocardiogram may be merely a part of the aging process. An isolated abnormal electrocardiogram does not inevitably indicate organic heart disease. It may imply some temporarily disturbed function, as in the innervation or hormonal control of the heart, constituting part of the picture of psychosomatic disturbances, and may actually have been engendered by fear or excitement associated with the taking of the record.

Even an abnormal electrocardiogram associated with organic heart disease may be benign or occult, requiring no alteration in the manner of living of the patient. The abnormal electrocardiogram is less important than the circumstances under which it occurs. Taking an electrocardiogram does not absolve the clinician from also using sound clinical judgment. Contrariwise, a normal electrocardiogram is no guarantee that the heart is normal. The electrocardiogram is only part of the clinical examination, an important adjuvant which should never be omitted in a patient with heart disease or in a person in the coronary age group. Under such circumstances it serves as a scanning test, possibly throwing out hints to the alert clinician to examine his patient more carefully.

Experience has shown that the clinical utility of the electrocardiogram depends upon the information it gives about several of the physiologic properties of the heart, including its irritability, rhythmicity and conductivity. It furnishes no information concerning the contractile power of the heart or its tone.—Louis N. Katz, M.D., Advances in Electrocardiography, *The Medical Clinics of North America*, January, 1952.

CLINICAL NOTES

HERNIATION OF THE URETER INTO THE SCIATIC FORAMEN ("CURLICUE URETER")

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William Baurys, M.D.
Jean Brochu, M.D.
and
William A. Morton, M.D., Sayre, Pa.

Herniation of a ureter into the sciatic foramen is extremely rare. We have been able to find only one previously reported case, that of Lindbom.[1] That author was unable to find any previous similar report. We have recently observed this condition and feel that its description is worth while. Because of the typical appearance, diagnosis should not be difficult.

REPORT OF A CASE

The patient, a white woman aged 66, had long had diffuse arteriosclerotic disease with chronic auricular fibrillation. She had also had a left hip fracture with nonunion. In March, 1949, while in another hospital, she had a cerebrovascular accident, and gangrene of the left leg developed. The gangrene was ascribed to an embolus. A left midthigh amputation was performed on the leg with the nonunion of the hip.

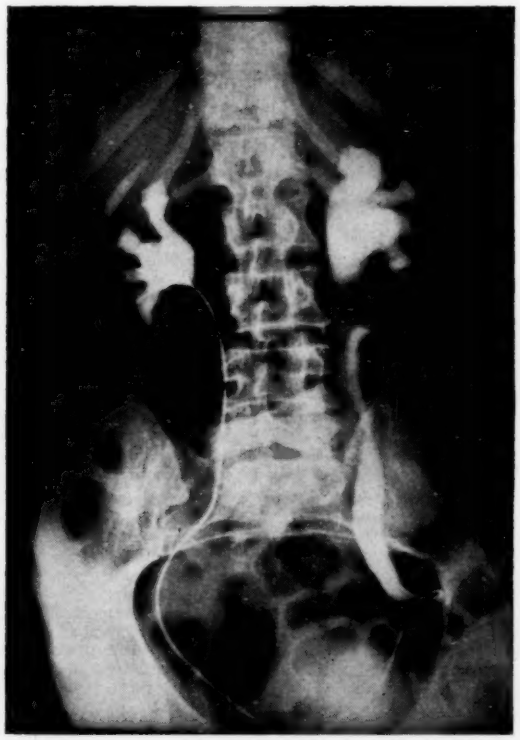


Fig. 1.—Preoperative roentgenogram of retrograde study. Note the "curlicue" of the left ureter and hydronephrosis.

She was seen by us in June, 1951. She reported five or six episodes of severe, colicky pain in the left loin radiating to the left groin in the preceding year. The episodes of pain would last three or four days. The distress was frequently associated with nausea and vomiting. Physical examination revealed severe arteriosclerosis. Although auricular fibrillation was present, there was no evidence of decompensation. Definite tenderness in the left costovertebral angle was elicited. The urine contained many pus cells, but no other abnormalities were noted in laboratory studies with the exception of moderate leukocytosis and an increased sedimentation rate. Results of pyelographic studies, both excretory and retrograde, were entirely normal. Urine culture revealed Escherichia coli. The diagnosis was left-sided pyelonephritis. With antibiotic therapy she became asymptomatic.

Fig. 2.—Postoperative intravenous pyelogram, showing lateral position of the ureter and normal kidney pelvis.

Four months later, the patient returned to the clinic. Her complaints were identical with those on her previous admission. She had an attack once a week, every Wednesday morning. During these episodes, the pain persisted for 24 hours and was associated with low grade fever. On each Thursday morning, the pain relented, and the patient was able to resume her usual activities. At this time, the urine was again found to contain many pus cells. Retrograde pyelography showed a tight loop in the left ureter, about 1 cm. in diameter, at about the midplane of the pelvis (fig. 1). This "curlicue" obviously produced a pronounced hydroureter and hydronephrosis from this point upward. A review of previous studies disclosed nothing that resembled the "curlicue" appearance; thus, the lesion must have been either acquired or intermittent. A preoperative diagnosis of ureteral obstruction due to an adhesion or retroperitoneal lymphatic malignant disease was entertained.

On Oct. 27, 1951, an operation was performed, and a loop of ureter was found herniated into the greater sacrosciatic foramen, above the pyriformis. There was an intimate relation with the gluteal artery, the innominate bone, and the pyriformis muscle. Above this point the ureter was considerably dilated. Below, the ureter was somewhat contracted. It was possible to reduce the hernia with its entire sac. This left an opening in the sciatic foramen that would admit the index finger for approximately 3 cm. The ureteral loop, after reduction, was seen to be covered with a sac-like membrane. When this was removed, the ureteral "curlicue" was easily straightened out, although the indwelling ureteral catheter now became kinked.

From the departments of surgery and urology at the Guthrie Clinic.

1. Lindbom, A.: Unusual Ureteral Obstruction by Herniation of Ureter into Sciatic Foramen: Report of Case, Acta radiol. **28**: 225-226, 1947.

The hiatus in the sciatic foramen was repaired by filling the defect with oxycel® (absorbable hemostatic) gauze, and the base of the broad ligament was then brought over to cover this area. The ureter was sutured in a more lateral position. Postoperative studies revealed a complete reduction of the hydroureter and hydronephrosis. The ureter now lay in a much more lateral position (fig. 2).

As the patient was about to return home, she experienced moderately severe cardiac decompensation with pleural effusion. However, she responded well to treatment and was discharged from the hospital as cured.

COMMENT

The part played in the causation of this condition by the old amputation, the mal-united fracture of the left hip, and atrophy of the gluteal musculature is difficult to evaluate. This is especially true since we do not have a series of cases from which to draw conclusions. The "curlicue" appearance of the ureter illustrated in figure 1 was also seen in Lindbom's case. Its appearance is so striking that it may well represent a diagnostic sign. We have not observed it in association with any other condition.

The manner of handling the defect by the reduction of the hernia is somewhat unusual. Apparently almost any method may be used in closing the opening with successful results, as we have seen no reports of recurrent sciatic hernias when other structures were involved. The method used in this case was simple and, we hope, effective.

It is of collateral interest to note that Watson,[2] in 1946, was able to find only 35 cases of sciatic hernia in the literature. He also was able to find only 102 case histories of the presence of a ureter in a hernia.

SUMMARY

A case of ureteral herniation into the sacrosciatic foramen is reported. As far as we could determine, this is the second such case to be reported in the literature. The deformity as demonstrated by the ureterogram appears to be typical and diagnostic, and we have called it a "curlicue ureter."

2. Watson, L. F.: Hernia, ed. 3, St. Louis, C. V. Mosby Company, 1948.

The Coroner System.—The coroner system had its origin in England in the late twelfth century and appeared in the earliest records of the American Colonies. Since that time the scope and nature of the coroner's duties have evidenced little change. There is probably no field of legal or medical activity in which progress has met with such organized and bitter opposition as that of the coroner. Despite the fact that the opinion of a coroner or the verdict of his jury may make the difference between execution and acquittal in a homicide trial or between poverty and inheritance of enough to support the surviving children of the victim of sudden death; despite the fact that these opinions are almost if not entirely medical in nature, two-thirds of the states today do not require that their coroner be a physician or have any medical training whatsoever! Truly the generations to come will have difficulty in comprehending this enigma of sanctification of ignorance!—Russell S. Fisher, M.D., The Changing Perspective in Medicolegal Practice, *The Proceedings of the Institute of Medicine of Chicago*, March 15, 1952.

COUNCIL ON PHARMACY AND CHEMISTRY

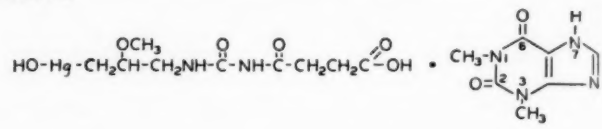
NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

R. T. STORMONT, M.D., *Secretary.*

Meralluride-U.S.P. — Mercuhydrin (Lakeside). — $C_9H_{16}HgN_2O_8 \cdot C_7H_8N_4O_2$. — M.W. 629.00. — 1-(3'-Hydroxymercuri-2'-methoxypropyl)-3-succinylurea and theophylline.—"Meralluride consists of methoxyoxymercuripropylsuccinylurea (the mercuric compound, $C_9H_{16}HgN_2O_6$, mol. wt. 448.84), and of theophylline in approximately molecular proportions. Meralluride, dried at 105° for 3 hours, contains not less than 94 per cent and not more than 106 per cent of the labeled amounts of the mercuri compound and of anhydrous theophylline ($C_7H_8N_4O_2$)." *U.S.P.*

The structural formula of meralluride may be represented as follows:



Actions and Uses.—Meralluride is a mercurial diuretic used for the preparation of solutions of its sodium salt for injection. The drug, as the non-reacted acid with sodium bicarbonate, is utilized for rectal administration in the form of suppositories. The latter are suitable as a supplement to parenteral injections of the sodium salt to prolong the edema-free period. Suppositories alone may control mild cases of edema. The indications and precautions are the same as for other mercurials.

Dosage.—Rectally, a suppository containing 0.6 gm. of meralluride is given daily; as a supplementary measure to parenteral administration, one suppository may be given daily beginning one to three days after injection.

Tests and Standards.—

For description and standards see the U. S. Pharmacopeia under Meralluride.

Dosage Forms of Meralluride

SUPPOSITORIES. *Identity Tests:* Shave an amount of suppositories equivalent to about 0.5 gm. of meralluride. Place the shavings in a 50 ml. round-bottomed flask, add 5 ml. of water and 3 ml. of formic acid, and reflux the mixture for 10-15 min.: a gray precipitate forms (*presence of mercury*). Decant the solution through a small filter paper and cool the filtrate in ice-water. Filter the mixture, wash the precipitate with two 5 ml. portions of ice-water, save the filtrate and washings, and dry the precipitate at 80° for 1 hour: the allylsuccinylurea obtained melts between 145 and 148°.

Heat to boiling the filtrate saved from the previous test. Pass hydrogen sulfide through it for about 10 min. Filter the mixture, cool the filtrate and transfer it to a 125 ml. separatory funnel. Add 10 gm. of sodium acetate and extract with three 10 ml. portions of chloroform. Evaporate the combined chloroform extracts nearly to dryness on a steam bath and complete the drying in a current of warm air. Suspend the residue in 5 ml. of water, heat to boiling to dissolve the residue and filter the hot solution. Cool the filtrate in an ice-bath. Remove the crystals by filtration, wash them with water and dry them at 105° for 4 hours: the theophylline melts between 270 and 275° and responds to the identity tests for theophylline, *U. S. P. XIV*, p. 621.

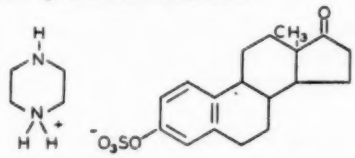
Assay: (Mercury) Transfer to a 250 ml. volumetric flask an amount of suppositories equivalent to about 3 gm. of mercury, and add 125 ml. of water and 15 ml. of 0.1 *N* sodium hydroxide. Heat the mixture carefully on a steam bath and shake the flask occasionally until all the material dissolves. If necessary, use an antifoaming agent. Cool, dilute to the mark with water and mix well. Transfer to a 250 ml. round-bottomed flask an aliquot, accurately measured, equivalent to about 40 mg. of mercury, add 30 ml. of nitric acid and reflux the mixture until it is colorless (about 3 hours). Cool the contents of the flask and quantitatively transfer them to a 400 ml. beaker. Dilute the solution to about 150 ml. with water, add 2 ml. of ferric ammonium sulfate T.S. as an indicator and titrate with 0.02 *N* ammonium thiocyanate. Each milliliter of 0.02 *N* ammonium thiocyanate is equivalent to 0.002006 gm. of mercury. The amount of mercury present is not less than 90.0 nor more than 110.0% of the labeled amount.

(Theophylline) Transfer to a 500 ml. volumetric flask an amount of suppositories equivalent to about 0.9 gm. of anhydrous theophylline. Add 250 ml. of water. Heat the mixture on a steam bath until the suppositories disintegrate. Add 25 ml. of ammonia T.S. and continue heating until all the material dissolves. If necessary, use an antifoaming agent. Cool, dilute to the mark with water and mix well. Transfer to a 250 ml. beaker an aliquot, accurately measured, equivalent to about 180 mg. of anhydrous theophylline. Add 20 ml. of 0.1 *N* silver nitrate and heat on a steam bath for 20 min. or until the precipitate coagulates. Filter the mixture through a fritted glass crucible of medium porosity. Wash the precipitate with water until the washings give no opalescence with 10% sodium chloride acidified with nitric acid. Dissolve the precipitate in 10 ml. of nitric acid, allowing the nitric acid solution to filter into a 500 ml. suction flask, at first without, and then with, a slight vacuum. Wash the crucible with hot water until the filtrate and washings approximate 150 ml. Cool the filtrate, add 2 ml. of ferric ammonium sulfate T.S. as an indicator and titrate with 0.1 *N* ammonium thiocyanate. Each milliliter of 0.1 *N* ammonium thiocyanate is equivalent to 0.01802 gm. of anhydrous theophylline. The amount of anhydrous theophylline present is not less than 90.0 nor more than 110.0% of the labeled amount.

Lakeside Laboratories, Inc., Milwaukee.

Suppositories Mercuhydrin: 0.6 gm. of meralluride (equivalent to 0.19 gm. of mercury). Buffered with 80 mg. of sodium bicarbonate.

Piperazine Estrone Sulfate.—Sulestrex Piperazine (Abbott).—$C_4H_{11}N_2.C_{18}H_{21}O_5S$.—M.W. 436.56.—Piperazine estrone sulfate marketed for use as a drug is stabilized with a small amount of free piperazine.—The structural formula of piperazine estrone sulfate may be represented as follows:



Actions and Uses.—Piperazine estrone sulfate has the same Actions and Uses as other estrogens.

Dosage.—Piperazine estrone sulfate is administered orally. For the control of menopausal symptoms, 1.5 mg. daily is usually sufficient. The dosage may be increased if the response is not satisfactory; it may be gradually reduced when the symptoms have been controlled. For the treatment of senile vaginitis, kraurosis vulvae, and pruritis vulvae, 1.5 to 4.5 mg. should be adequate. For postpartum breast engorgement, 4.5 mg. is administered at four-hour intervals for five doses.

Tests and Standards.—

Physical Properties: Piperazine estrone sulfate is a fine, white to creamy white, odorless, crystalline powder. It melts between 185 and 195° to a light brown syrup, which solidifies on further heating, and finally melts with decomposition between about 240 and 250°. It is slightly soluble in water and alcohol.

Identity Tests: Dissolve about 10 mg. of piperazine estrone sulfate in 5 ml. of water. Add 5 ml. of a solution prepared by dissolving 1 gm. of quinone in 5 ml. of glacial acetic acid and diluting up to 100 ml. with alcohol. Boil the resultant solution, then cool it and allow it to stand: a currant-red color appears *(presence of piperazine)*.

To about 1 mg. of piperazine estrone sulfate add 1 ml. of a 2.5% solution of β-naphthol in sulfuric acid and heat the material for 2 min. in a boiling water bath. Cool the solution and add 1 ml. of water: an orange-yellow color appears; heat for 90 sec. in the boiling water bath: the color becomes red-orange *(presence of estrone)*.

Purity Tests: Dry about 0.25 gm. of piperazine estrone sulfate, accurately weighed, at 105° for 1 hour: the loss in weight is not more than 1.0%.

Char about 0.1 gm. of piperazine estrone sulfate, accurately weighed. Cool, add a few drops of sulfuric acid to the charred mass and ignite: the amount of residue is not more than 0.1%.

Assay: (Estrone) Transfer exactly 12 mg. of piperazine estrone sulfate to a 100 ml. volumetric flask, dilute to the mark with water and shake the flask vigorously for several minutes to dissolve the material completely. Pipet a 20 ml. aliquot into a test tube and add 2 ml. of hydrochloric acid. Heat the tube in a boiling water bath for 10 min. Quantitatively transfer the contents of the tube to a 250 ml. separatory funnel, using a total of 80 ml. of rinse water. Add the washings to the separatory funnel and extract the estrone with one 35 and two 15 ml. portions of benzene. Wash the combined benzene extracts with 25 ml. of water, 2 ml. of 9% sodium bicarbonate, 15 ml. of 9% sodium carbonate, 10 ml. of water, 2 ml. of 50% sulfuric acid, and two 10 ml. portions of water. Carefully and completely withdraw the benzene to a dry 250 ml. beaker containing a small amount of anhydrous sodium sulfate and swirl until the benzene is clear. Decant the benzene into a 100 ml. volumetric flask, excluding the sodium sulfate. Rinse the beaker with several small portions of benzene and add them to the volumetric flask. Fill to the mark with benzene and mix thoroughly. Transfer a 2 ml. aliquot of this solution to a test tube.

Prepare an estrone standard containing 25 γ per ml. of estrone in alcohol. Transfer a 1 ml. aliquot of estrone standard to a test tube. Evaporate the sample and standard to dryness on a steam bath with the aid of a current of air. Cool the tubes in an ice-bath.

Redistil phenol into a glass-stoppered flask, discarding the first 10% and the last 5% of the distillate. Add to the phenol 1.55 times its weight of sulfuric acid, mix thoroughly, and cool. Add 3 ml. of the reagent to the standard, the sample, and a blank; and stopper the tubes and place them in a boiling water bath for 20 min., shaking the tubes 4 times during the heating period. Transfer the tubes to an ice-bath for 5 min., then remove them and add 3 ml. of water. Stir the contents with a glass rod until thoroughly mixed. Leave the glass rods in the tubes until the color development is completed. Place the tubes in the boiling water bath for 3 min., and then remove them to the ice-bath for 5 min. Add 9 ml. of 5% sulfuric acid to the tubes and mix thoroughly. Determine the optical absorbancies of the sample and standard relative to the blank at 5220 Å. The amount of estrone present is not less than 56.0 nor more than 63.0%, equivalent to not less than 90.4 nor more than 101.7% of piperazine estrone sulfate.

(Nitrogen) Transfer about 0.1 gm. of piperazine estrone sulfate, accurately weighed, to a semi-micro Kjeldahl flask, and digest it with 7 ml. of sulfuric acid, 2.7 gm. of potassium sulfate and 0.3 gm. of mercuric oxide for 4 hours. Dilute the clear solution to 15 ml. with water, make it alkaline with 40% sodium hydroxide and then add 10 ml. of 40% sodium thiosulfate. Distil the ammonia into 20 ml. of 4% boric acid. Using a mixed indicator (1:5 methyl red T.S. and bromocresol green T.S.), titrate the ammonia liberated with 0.05 *N* sulfuric acid. Each milliliter of 0.05 *N* acid is equivalent to 0.0007004 gm. of nitrogen. The amount of nitrogen present is not less than 6.4 nor more than 7.0%.

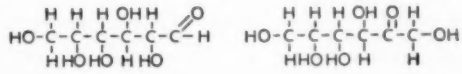
Dosage Forms of Piperazine Estrone Sulfate

TABLETS. *Assay:* Grind 25 tablets to a fine powder. Transfer to a glass-stoppered 250 ml. Erlenmeyer flask a sample of the powder, accurately weighed, equivalent to 12 mg. of piperazine estrone sulfate. Add exactly 100 ml. of water and place the flask in a shaking machine for 1 hour. Filter the solution through Whatman No. 1 or equivalent filter paper (paper which retains medium-sized particles), discarding the first portion of the filtrate. Transfer to a test tube exactly 20 ml. of the filtrate and proceed as directed in the assay for estrone in the monograph for Piperazine Estrone Sulfate starting with, ". . . and add 2 ml. of hydrochloric acid . . ." The amount of piperazine estrone sulfate present is not less than 90.0 nor more than 110.0% of the labeled amount.

Abbott Laboratories, North Chicago, Ill.

Tablets Sulestrex Piperazine: 0.75 mg., 1.5 mg., and 3 mg. U. S. Trademark 505,252.

Invert Sugar.—Travert (Baxter).—Invert sugar is an equimolecular mixture of dextrose and levulose prepared by the inversion of aqueous solutions of sucrose. The structural formulas of dextrose and levulose may be represented as follows:



Actions and Uses.—Invert sugar, a mixture of equal parts of dextrose (D-glucose) and levulose (D-fructose), is used in place of dextrose for parenteral carbohydrate alimentation. Its caloric value, gram for gram, is identical with that of dextrose. Evidence, however, indicates that invert sugar is more rapidly utilized than dextrose. The rapidity with which invert sugar is utilized is probably caused by a more rapid utilization rate of the fructose portion and further influence of the fructose upon the glucose portion. Clinical studies indicate that intravenous infusions of 50 gm. of invert sugar may be given approximately twice as fast as the same amount of dextrose without producing glycosuria. With infusion of larger amounts at this faster rate, the loss of sugar in the urine from invert sugar is only about one-tenth that which occurs from dextrose. This makes it possible to supply more nearly the carbohydrate requirements of patients who need parenteral alimentation.

Dosage.—Invert sugar for parenteral carbohydrate alimentation may be administered intravenously, subfascially, or subcutaneously. Preparations containing 5% or 10% in either water or isotonic sodium chloride solution are suitable for this purpose and do not subject patients to the discomfort usually accompanying the subcutaneous or subfascial administration of corresponding concentrations of dextrose. One liter of 10% invert sugar supplies approximately 400 calories and can be administered in the same time required for an equal quantity of 5%

dextrose which supplies approximately 200 calories. Usual precautions taken with other forms of parenteral alimentation should be observed when administering invert sugar.

Tests and Standards.—

Invert sugar is prepared in the form of a concentrated solution which responds to the following tests and standards.

Physical Properties: Invert sugar solutions are clear and colorless. The specific rotation, [α]25,D, of a 16% solution is between —17.0 and —19.5°. The solutions have a pH of 3.5-6.0.

Identity Tests: To 5 ml. of hot alkaline cupric tartrate T.S. add a few drops of a 5% solution of invert sugar: a red precipitate of cuprous oxide appears *(presence of reducing sugars).*

Prepare a 0.05% solution of resorcinol in hydrochloric acid diluted 1:1. To 5 ml. of the solution add 1 ml. of a 4% solution of invert sugar and heat in a boiling water bath for 2 min.: a red-orange color appears *(presence of ketohexose).*

Prepare a solution containing 1 gm. of phenylhydrazine hydrochloride and 1.5 gm. of sodium acetate in 10 ml. of water by heating the mixture to about 60°, cooling, and then filtering. To 5 ml. of this solution in a test tube add 3 ml. of a 5% solution of invert sugar. Place the test tube in a boiling water bath for about 10 min. Crystals begin to appear in 3-5 min. Cool the reaction mixture, filter it, and wash the precipitate with three 10 ml. portions of water followed by single washings with 5 ml. of alcohol and 5 ml. of ether. Dry the residue at 105° for 30 min.: the yellow osazone formed melts at 205-210°.

Purity Tests: To a volume of solution containing 1 gm. of invert sugar add 1 ml. of ammonium oxalate T.S.: the solution remains clear for 1 min. *(absence of calcium).*

To 50 ml. of solution containing 10 gm. of invert sugar add 2 ml. of nitric acid and exactly 10 ml. of 0.02 *N* silver nitrate. Heat the mixture on a steam bath to coagulate the silver chloride, cool, and add 5 ml. of nitrobenzene and 2 ml. of ferric ammonium sulfate T.S. Titrate the excess silver nitrate with 0.02 *N* ammonium thiocyanate. Each milliliter of 0.02 *N* silver nitrate consumed is equivalent to 0.0007092 gm. of chloride: no more than 0.025% W/V of chloride is present.

To 20 ml. of a solution containing 5 gm. of invert sugar add 1 ml. of diluted hydrochloric acid and 2 ml. of barium chloride T.S.: the turbidity produced is no greater than that from 0.3 ml. of 0.02 *N* sulfuric acid treated in the same manner, corresponding to not more than 60 ppm of sulfate.

Transfer to a test tube a portion of solution containing 1 gm. of invert sugar. Add 5 ml. of ether and shake vigorously. Separate the layers, transfer 2 ml. of the ether layer to a test tube, and add 1 ml. of a 1% solution of resorcinol in hydrochloric acid: no cherry-red color appears immediately *(absence of hydroxymethylfurfural).*

Transfer to a tared crucible a volume of solution containing the equivalent of 3 gm. of invert sugar and remove the water by evaporation on a steam bath. Char the residue, cool, add 1 ml. of concentrated sulfuric acid, and continue ignition until no carbon remains: the amount of residue is not more than 0.05%. Save this residue for the heavy metals test.

Proceed with the residue from the ashing as directed in the heavy metals test for dextrose in *U.S.P. XIV*, p. 167, starting with, ". . . add a mixture of 30 cc. of diluted hydrochloric acid . . ." The heavy metals limit is 5 ppm.

Assay: (Invert Sugar) Prepare a 1% solution of invert sugar and using 20 ml. of this solution assay for invert sugar as directed in *Official Methods of Analysis of the Association of Official Agricultural Chemists*, ed. 7, A.O.A.C., Washington, 1950, p. 506-507, par. 29.35-29.37. The solution is not less than 95.0 nor more than 105.0% of the labeled amount.

(Sucrose) Transfer to a 100 ml. volumetric flask 40 ml. of the 1% solution of invert sugar prepared for the assay for invert sugar. Add 20 ml. of water and 8 ml. of 21% hydrochloric acid. Heat a water bath to 70° and regulate the heat input so that the temperature of the bath remains about at that point. Place the flask in the bath and after the solution reaches 67°, leave the flask in the bath exactly 5 min. longer, during which time the temperature of the solution gradually rises to 69.5°. Cool in water to about 20°, neutralize the solution with sodium hydroxide T.S., using methyl red T.S. as an indicator, and fill to volume. Using 50 ml. of the solution, assay for invert sugar as previously directed. The percentage of sucrose equals 0.95(A-B), where A and B are percentages of invert sugar after and before inversion, respectively. The amount of sucrose present is not more than 2.0%.

Dosage Forms of Invert Sugar

The dosage forms are prepared by appropriate dilution of the concentrated invert sugar solution.

SOLUTIONS. *Identity Tests:* The solutions respond to the identity tests listed in the monograph for Invert Sugar.

Assay: The solutions respond to the assay method for invert sugar described in the monograph on Invert Sugar. The amount of invert sugar present is not less than 95.0 nor more than 105.0% of the labeled amount.

Baxter Laboratories, Inc., Morton Grove, Ill.

Solution Travert 5% in Water (or Saline): 150 cc. and 1 liter bottles. A solution in water or isotonic sodium chloride containing 50 mg. of invert sugar in each cubic centimeter.

Solution Travert 10% in Water (or Saline): 150 cc. and 1 liter bottles. A solution in water or isotonic sodium chloride containing 0.1 gm. of invert sugar in each cubic centimeter. U. S. Trademark 534,117.

Tyrothricin-U.S.P. (See New and Nonofficial Remedies 1951, p. 44).

Sharp & Dohme, Inc., Glenolden, Pa.

Solution Soluthricin 0.05%: 240 cc. bottles. A solution in 1% alcohol, propylene glycol, and water containing 0.5 mg. each of tyrothricin and cetyldimethylethylammonium bromide in each cubic centimeter.

Solution Soluthricin (Concentrate) 2.5%: 10 cc. and 20 cc. vials. A solution in 50% alcohol and propylene glycol containing 25 mg. each of tyrothricin and cetyldimethylethylammonium bromide in each cubic centimeter. U. S. Trademark 421,710.

Phenobarbital Sodium-U.S.P. (See New and Nonofficial Remedies 1951, p. 248).

Winthrop-Stearns, Inc., New York.

Solution Luminal Sodium in Propylene Glycol: 2 cc. Ampins. A solution in propylene glycol, containing 0.16 gm. of phenobarbital sodium in each cubic centimeter. The solution may be administered intramuscularly or subcutaneously, but not intravenously. U. S. Trademark 87,327.

Progesterone-U.S.P. (See New and Nonofficial Remedies 1951, p. 361).

Kremers-Urban Company, Milwaukee.

Solution Progesterone in Oil with Benzyl Alcohol 5%: 10 cc. vials. A solution in sesame oil containing 25 mg. of progesterone in each cubic centimeter.

Tubocurarine Chloride-U.S.P. (See New and Nonofficial Remedies 1951, p. 163).

E. R. Squibb & Sons, New York.

Suspension Tubocurarine Chloride in Oil with Myricin: 5 cc. vials. A suspension in peanut oil containing 27 mg. of tubocurarine chloride and 48 mg. of myricin in each cubic centimeter.

Zincundecate (See New and Nonofficial Remedies 1951, page 49).

Veltex Company, Birmingham, Ala.

Ointment Undesol: 30 gm., 60 gm., 454 gm., and 2270 gm. jars. An ointment containing 0.2 gm. of zinc undecylenate and 50 mg. of undecylenic acid in each gram.

Amphetamine Sulfate-U.S.P. (See New and Nonofficial Remedies 1951, p. 188).

Gold Leaf Pharmacal Company, Inc., New Rochelle, N. Y.

Tablets Amphetamine Sulfate: 5 mg. and 10 mg.

Ascorbic Acid-U.S.P. (See New and Nonofficial Remedies 1951, p. 429).

Physicians' Drug & Supply Company, Philadelphia

Tablets Ascorbic Acid: 25 mg., 50 mg., and 100 mg.

Chorionic Gonadotropin (See New and Nonofficial Remedies 1951, p. 359).

Sharp & Dohme, Inc., Glenolden, Pa.

Lyovac Chorionic Gonadotropin: 10 cc. vials. A powdered preparation of chorionic gonadotropin which, when diluted with the accompanying 10 cc. of sterile distilled water containing 0.35% phenol, provides a solution having a potency of 500 I.U. in each centimeter.

CORRECTION

Balarsen.—In the list of new generic and brand names in THE JOURNAL, May 3, 1952, page 63, Balarsen was erroneously spelled Balarsan.

MEDICAL LICENSURE STATISTICS FOR 1951

FIFTIETH ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Donald G. Anderson, M.D., Secretary, and Anne Tipner

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This report is the 50th annual compilation of information and statistics pertaining to medical licensure in the United States and its territories and outlying possessions by the Council on Medical Education and Hospitals of the American Medical Association.

The report presents statistics for the medical examining boards of all the states, the District of Columbia, Alaska, Hawaii, Puerto Rico, Guam, the Virgin Islands, and the Canal Zone. The figures for Arkansas, Connecticut, and Maryland also include data reported by the homopathic medical examining boards of those states.

As in previous years, there is included data pertaining to the National Board of Medical Examiners and the 21 boards of examiners in the basic sciences.

The compilations included in this study were obtained from official reports. The Council and THE JOURNAL express their appreciation to the officers of the examining and licensing agencies for these data and for other records furnished throughout the year to the office of the Council.

The tables referring to medical licensure include figures for the number of candidates examined for medical licensure in 1951 and also for those licensed on the basis of reciprocity or endorsement of credentials. There are also included other data pertaining to the regulations for medical licensure both of physicians who secured their professional training in the United States and Canada and of physicians educated in other countries. The state boards are discussed first, followed by the basic science boards and the National Board of Medical Examiners.

STATE BOARDS OF MEDICAL EXAMINERS

Licenses Issued

During the year 1951 there were 12,008 licenses to practice medicine issued by the medical examining boards of the 48 states, the District of Columbia, Alaska, Hawaii, Puerto Rico, Guam, the Virgin Islands, and the Canal Zone. The number licensed in each state, by examination or by the endorsement of credentials, is shown in table 1. Of the 12,008 licenses issued, 5,713 were granted after written examination and 6,295 by reciprocity or endorsement of state licenses or the certificate of the National Board of Medical Examiners.

TABLE 1.—*Licenses Issued, 1951*

	Examination	On the Basis of Reciprocity and Endorsement	Total
Alabama	69	59	128
Arizona	14	60	74
Arkansas	83	46	129
California	523	844	1,367
Colorado	84	84	168
Connecticut	33	195	228
Delaware	13	15	28
District of Columbia	27	139	166
Florida	329	0	329
Georgia	146	80	226
Idaho	8	35	43
Illinois	462	203	665
Indiana	113	125	238
Iowa	77	85	162
Kansas	92	93	185
Kentucky	101	82	183
Louisiana	218	85	303
Maine	15	30	45
Maryland	176	122	298
Massachusetts	35	264	299
Michigan	203	214	417
Minnesota	166	134	300
Mississippi	77	53	130
Missouri	228	128	356
Montana	3	38	41
Nebraska	96	33	129
Nevada	0	13	13
New Hampshire	6	41	47
New Jersey	54	275	329
New Mexico	0	54	54
New York	336	771	1,107
North Carolina	125	113	238
North Dakota	26	16	42
Ohio	352	312	664
Oklahoma	75	53	128
Oregon	42	75	117
Pennsylvania	277	272	549
Rhode Island	12	28	40
South Carolina	63	55	118
South Dakota	21	25	46
Tennessee	174	79	253
Texas	307	325	632
Utah	27	37	64
Vermont	2	13	15
Virginia	168	123	291
Washington	52	136	188
West Virginia	26	73	99
Wisconsin	129	87	216
Wyoming	4	23	27
Alaska, Canal Zone, Guam, Hawaii, Puerto Rico, and the Virgin Islands	44	50	94
Totals	5,713	6,295	12,008

Marginal Number	SCHOOL	Alabama		Arizona		Arkansas		California		Colorado		Connecticut		Delaware		Dist. of Columbia		Florida		Georgia		Idaho		Illinois		Indiana		Iowa		Kansas		Kentucky		Louisiana		Maine		Maryland		Massachusetts		Michigan		Minnesota	
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	ALABAMA																																											
1	Medical College of Alabama, Birmingham	53	2															5	2	2	0																								
	ARKANSAS																																											
2	University of Arkansas School of Medicine, Little Rock					81	4											4	0																								
	CALIFORNIA																																											
3	University of California School of Medicine, San Francisco							71	1															1	0							1	0					1	0				
4	Coll. of Medical Evangelists, Loma Linda-Los Angeles							67	2	6	0					1	0	3	0					1	0					1	0					2	0			1	0		
5	Univ. of So. California School of Med., Los Angeles							57	0									1	0					0	1													0	1			
6	Stanford University School of Medicine, Stanford University-San Francisco							59	2																											1	0						
	COLORADO																																											
7	University of Colorado School of Medicine, Denver			2	0			0	1	53	0							1	0											1	0											
	CONNECTICUT																																											
8	Yale University School of Medicine, New Haven											1	0	1	0			3	0																								
	DISTRICT OF COLUMBIA																																											
9	Georgetown University School of Med., Washington	1	0					1	0							1	0	2	0																							4	0
10	George Washington Univ. School of Med., Washington																	8	1					1	0																		
11	Howard University College of Medicine, Washington	1	0					5	1							10	0	1	0					2	2							2	0			8	0			1	0		
	GEORGIA																																											
12	Medical College of Georgia, Augusta																	15	3	7	4	0																					
13	Emory University School of Medicine, Atlanta																	21	0	6	0	0																					
	ILLINOIS																																											
14	Chicago Medical School							1	0			1	0					3	0					19	0							2	0							1	0		
15	Northwestern University Medical School, Chicago	1	0	1	0			10	0									8	1			1	0	75	1	3	0			2	0	1	0			1	0	2	0	13	0	6	0
16	Stritch School of Med. of Loyola University, Chicago			1	0			3	0	2	0	2	0					6	0					39	1	1	0					2	0	2	0					3	0		
17	University of Chicago, The School of Medicine							3	0													1	0	16	0	3	0													2	0	5	0
18	University of Illinois College of Medicine, Chicago			1	0			18	2							1	0	7	2					113	1	1	0	1	0					1	0			1	0			1	0	6	0
	INDIANA																																											
19	Indiana University School of Medicine, Bloomington-Indianapolis					1	0	2	0									8	3					3	0	100	2													1	0		
	IOWA																																											
20	State University of Iowa College of Med., Iowa City							3	0									0	1					1	0			62	0			1	0							2	0		
	KANSAS																																											
21	Univ. of Kansas School of Med., Lawrence-Kansas City																	2	1					2	0					83	0											3	0
	KENTUCKY																																											
22	University of Louisville School of Medicine																	5	2					1	0							90	0									2	0
	LOUISIANA																																											
23	Louisiana State Univ. School of Med., New Orleans							1	0									4	0															86	0								
24	Tulane University of Louisiana School of Medicine, New Orleans							3	0	1	0							17	1															104	0								
	MARYLAND																																											
25	Johns Hopkins University School of Med., Baltimore							2	0					1	0	1	0	5	0																			55	0			2	0
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore							1	0			1	0					5	0					2	0							1	0			1	0	71	0				
	MASSACHUSETTS																																											
27	Boston University School of Medicine							1	0									2	0																								
28	Harvard Medical School, Boston							3	0									7	0					2	0							1	0	2	0	1	0			4	0		
29	Tufts College Medical School, Boston																	6	2	1	0			2	0											3	0			1	0		
	MICHIGAN																																											
30	University of Michigan Medical School, Ann Arbor							6	0									9	2					1	0															3	0	104	0		
31	Wayne University College of Medicine, Detroit							1	0	1	0							5	1																							57	0		
	MINNESOTA																																											
32	University of Minnesota Medical School, Minneapolis							5	0							1	0	1	0					2	0											2	0					86	0
	MISSOURI																																											
33	St. Louis University School of Medicine							5	0									7	0					4	0					1	0							1	0			1	0
34	Washington University School of Medicine, St. Louis			1	0			6	0									4	1					2	0							1	0										
	NEBRASKA																																											
35	Creighton University School of Medicine, Omaha							11	1	3	0	0	1													13	0	1	0							1	0			3	0		
36	University of Nebraska College of Medicine, Omaha							1	0															1	0															1	0		
	NEW YORK																																											
37	Albany Medical College																	3	0																								
38	State University of New York, College of Medicine at New York City							2	0			1	0					6	2	1	0																	1	0	1	0				
39	University of Buffalo School of Medicine																	4	0																			0	1				
40	Columbia University College of Physicians and Surgeons, New York											1	0			1	0	7	1															1	0					1	0	2	0
41	Cornell University Medical College, New York							2	0							1	0	3	1					1	0													1	0	2	0	1	0
42	New York Medical College, Flower and Fifth Avenue Hospitals, New York											1	0	1	0			4	0																	1	0						
43	New York University College of Medicine, New York							1	0									14	0											1	0							1	0	1	0		
44	Univ. of Rochester School of Medicine and Dentistry							3	0					1	0	1	0	1	0															2	0			2	0			1	0
45	State University of New York at Syracuse College of Medicine							2	0							1	0																	1	0			1	0			1	0
	NORTH CAROLINA																																											
46	Duke University School of Medicine, Durham			1	0													14	0													1	0	1	0					1	0		
47	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem							1	0									3	0																								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																				

Michigan P	Michigan F	Minnesota P	Minnesota F	Mississippi P	Mississippi F	Missouri P	Missouri F	Montana P	Montana F	Nebraska P	Nebraska F	Nevada P	Nevada F	New Hampshire P	New Hampshire F	New Jersey P	New Jersey F	New Mexico P	New Mexico F	New York P	New York F	North Carolina P	North Carolina F	North Dakota P	North Dakota F	Ohio P	Ohio F	Oklahoma P	Oklahoma F	Oregon P	Oregon F	Pennsylvania P	Pennsylvania F	Rhode Island P	Rhode Island F	South Carolina P	South Carolina F	South Dakota P	South Dakota F	Tennessee P	Tennessee F	Texas P	Texas F	Utah P	Utah F	Vermont P	Vermont F	Virginia P	Virginia F	Washington P	Washington F	West Virginia P	West Virginia F	Wisconsin P	Wisconsin F	Wyoming P	Wyoming F	Alaska, Hawaii, Puerto Rico and Virgin Islands P	Alaska, Hawaii, Puerto Rico and Virgin Islands F	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
																								2	0																																										66	62	4	6.1	4	1
																				2	0																																							1	0			1	0	93	89	4	4.3	5	2
																								2	0																																							2	0	79	78	1	1.3	6	3
1	0									1	1																									1	0		2	0	1	0											1	0									91	88	3	3.3	13	4
																																																																	60	58	2	3.3	4	5
																																																																	62	60	2	3.2	2	6
																																																																	60	59	1	1.7	7	7
																1	0							1	0					1	0																																			8	8	0	0.0	6	8
		4	0							2	0									2	0																					1	0																							12	12	0	0.0	7	9
																						2	0			1	0			1	0																															1	0	16	15	1	6.3	7	10
1	0			1	0	4	0					2	1							4	2	12	0							2	0																																	61	55	6	9.8	14	11
																																																																	92	89	3	3.3	2	12
		2	0																	2	1	3	0																																								89	88	1	1.1	5	13
1	0															2	0			8	5					2	0					4	0																													48	43	5	10.4	10	14
3	0	6	0	4	0	1	0													1	1			1	0	3	0			3	0											3	0									8	0			4	0					155	152	3	1.9	22	15
3	0					1	0													0	3			10	0			3	0					2	0																									1	0	82	78	4	4.9	16	16
2	0	5	0															1	0	1	1	1	0			3	0			1	0											1	0	1	0					3	0			1	0					44	43	1	2.3	15	17
1	0	6	0	2	0	3	0													1	0									2	0					1	0															2	0			5	0	1	0	2	0	175	170	5	2.9	20	18
				2	0																																																											125	120	5	4.0	9	19
2	0					3	0																	3	0									2	0			1	0															2	0					81	80	1	1.2	11	20
		3	0																									1	0																											2	0					94	93	1	1.1	6	21
		2	0																	1	0									1	0																									1	0			1	0	104	102	2	1.9	8	22
				7	0																	2	0			1	0																																			101	101	0	0.0	6	23
				6	0																																																									5	0	147	146	1	0.7	6	24
		2	0	2	0															2	0	2	0																																			1	0			1	0	74	74	0	0.0	11	25
						1	0					1	1									6	0							1	0																															92	91	1	1.1	11	26
																																1	0									1	0																			1	0	6	6	0	0.0	5	27
		4	0																	1	0	7	0			1	0			1	0											3	0					2	0									1	0	39	39	0	0.0	15	28
																																				1	0					1	0															1	0			18	16	2	11.1	8	29
4	0													1	0							1	0																																										127	125	2	1.6	7	30
	0													1	0																																																66	65	1	1.5	5	31
		86	0	1	0																	4	0													1	0			1	0	2	0							2	0											108	108	0	0.0	12	32
		1	0	1	0	2	0							1	0													2	1																																	126	125	1	0.8	10	33
				94	0									4	1	1	0																							1	0																							116	114	2	1.7	9	34
		3	0			1	0			22	2			0	1					1	0					1	0													3	0									2	0			1	0			1	0	69	64	5	7.2	16	35
	0					1	0			72	4									1	1																			4	0																			1	0	87	82	5	5.7	8	36
																				1	1																																										5	4	1	20.0	2	37
																3	0			6	5																	1	0																							1	0	30	23	7	23.3	10	38
																																																																7	6	1	14.3	3	39
0	2	0														2	0			3	0	1	0									2	0																											2	0	1	0			26	25	1	3.9	13	40
0	1	1		2	0							1	0							10	2											2	0											1	0									1	0					31	28	3	9.7	13	41
														2	0					6	0					1	0							1	0											1	0													18	18	0	0.0	9	42
																				6	3															1	0																			1	0			29	26	3	10.3	8	43
	0																			2	2	1	0		3	0					2	0											1	0	1	0									1	0	1	0			25	23	2	8.0	15	44
	0													1	0	1	0			1	2			1	0																							1	0													1	0	14	12	2	14.3	11	45
	0	1	0			1	0															2	0											2	0											2	0							1	0					27	27	0	0.0	11	46
		2	0	1	0															54	1	1	0																																			1	0	64	63	1	1.6	7	47
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50																		

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. of Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	Minnesota P	F
	OHIO																																										
48	University of Cincinnati College of Medicine	1	0															8	1					3	0									1	0								
49	Western Reserve University School of Med., Cleveland																							1	0					1	0									1	0
50	Ohio State University College of Medicine, Columbus																	9	0																						
	OKLAHOMA																																								
51	Univ. of Oklahoma School of Med., Oklahoma City																	3	0															2	0						
	OREGON																																								
52	University of Oregon Medical School, Portland					1	0	8	9	1	0									1	0			2	0															1	0
	PENNSYLVANIA																																								
53	Hahnemann Med. Coll. and Hospital of Philadelphia			1	0			0	1					1	0			5	0																	1	0			1	0
54	Jefferson Medical College of Philadelphia			1	0			3	0			2	0	3	0			9	2							1	0							1	0	1	0			0	1	2	0
55	Temple University School of Medicine, Philadelphia							3	0					1	0			10	0					2	0	1	0	1	0					1	0	1	0	1	0				3
56	Univ. of Pennsylvania School of Med., Philadelphia							4	0	1	0	1	0	1	0			9	0			1	0											1	0			1	0			2	0
57	Woman's Med. College of Pennsylvania, Philadelphia							1	0									2	0					2	0																
58	University of Pittsburgh School of Medicine							1	0									5	2													1	0								
	SOUTH CAROLINA																																								
59	Medical College of South Carolina, Charleston																	4	1					1	0																1
	TENNESSEE																																								
60	University of Tennessee College of Medicine, Memphis																	19	2					2	1							1	0							1	0
61	Meharry Medical College, Nashville							3	1									3	0	1	0			3	0							6	0	1	0			3	0	4	0
62	Vanderbilt University School of Medicine, Nashville	1	0					2	0									7	0	1	0																				
	TEXAS																																								
63	Southwestern Medical School of the University of Texas, Dallas	2	0					2	0									1	0																					1	0
64	University of Texas School of Medicine, Galveston							4	0									1	1																						
65	Baylor University College of Medicine, Houston							1	0									1	0																						
	UTAH																																								
66	University of Utah School of Med., Salt Lake City							13	0							1	0					4	0					1	0					1	0					3	0
	VERMONT																																								
67	University of Vermont College of Med., Burlington							1	0			5	1					1	0																	1	0			1	1		
	VIRGINIA																																								
68	University of Virginia Dept. of Med., Charlottesville													1	1			6	1					1	0													1	0		1	0	1
69	Medical College of Virginia, Richmond							1	0									7	1					1	0																
	WASHINGTON																																								
70	University of Washington School of Medicine, Seattle							11	1																																2
	WISCONSIN																																								
71	University of Wisconsin Medical School, Madison			2	0			3	0	1	0							1	0					4	0															1	0		4
72	Marquette University School of Medicine, Milwaukee			1	0			6	1	2	0							1	1					4	0																6
	CANADA																					1	0	1	0																
73	University of Alberta Faculty of Medicine, Edmonton																																								2
74	University of Manitoba Faculty of Med., Winnipeg							5	0									0	1					1	0															1	0	1	0	3
75	Dalhousie University Faculty of Medicine, Halifax							1	0																													2	1	1	0			1	0	1
76	Queen's University Faculty of Medicine, Kingston											3	0					0	1					1	0															1	0		1
77	University of Ottawa Faculty of Medicine, Ottawa																																								
78	University of Western Ontario Faculty of Medicine, London			1	0																			3	0	4	0														1
79	University of Toronto Faculty of Medicine							3	0			1	0					2	0	1	0			0	1	2	0	2	0									2	0			3	0	4
80	McGill University Faculty of Medicine, Montreal							10	0							1	0	1	1					2	0									2	0	2	0			1	0	3	0	1
81	University of Montreal Faculty of Medicine																																								
82	Laval University Faculty of Medicine, Quebec							1	0									0	2																	2	1			1	0		
	OTHERS																																								
83	Foreign Medical Faculties			1	0			56	40	3	1	13	8	1	0	6	2	8	2	4	0			92	82	0	1	1	0							0	4	18	14	6	19	4	1	7
84	Extinct Medical School																	8	1													1	0								2
85	Unapproved Medical Schools																	9	6	1	0			2	1															4	51		
86	Schools of Osteopathy									10	0	1	6	1	0																									2	5		
87	TOTALS	62		14		87		554		85		50		14		29		427		147		8		510		119		81		92		104		217		21		188		114		222	
88	Totals—Examined—Passed	60		14		83		500		84		34		13		27		374		147		8		419		116		81		92		104		217		15		174		35		221	
89	Totals—Examined—Failed	2		0		4		54		1		16		1		2		53		0		0		91		3		0		0		0		0		6		14		79		1	
90	Percentage Failed	3.2		0.0		4.6		9.7		1.2		32.0		7.2		6.9		12.4		0.0		0.0		17.8		2.5		0.0		0.0		0.0		0.0		28.6		7.4		69.3		0.5	
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21	

P—Passed; F—Failed.

It does not follow that all physicians certified after examination were tested in a given year. The licensing boards of 25 states, the District of Columbia, Alaska, Hawaii, Puerto Rico, the Virgin Islands, and Guam require a year of internship for licensure. In several of these states, the candidate for medical licensure is permitted to take the written examination before completion of the internship and, if he is successful, the license is issued and dated on completion of the internship requirement. Licenses are also withheld in some states for other technicalities. As a rule, the licenses of those examined in December are dated and issued in the following year. The figures in table 1, therefore, include some physicians who were examined in 1950 and a few in previous years. Figures in this table will not correspond with those compilations which deal entirely with physicians examined for licensure in 1951, but they do include persons who may have been licensed in more than one state in a given year. In tables 12, 13, and 14 (pages 462 and 463) can be noted the number who secured their first license to

23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						
Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Virgin Islands	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
						1 0		1 0			83 1																1 0	101	99	2	2.0	8	48
								3 0	2 0		69 0			1 0										1 0			1 0	80	80	0	0.0	9	49
											73 0																	82	82	0	0.0	2	50
	1 0								1 0			64 0					1 0											72	72	0	0.0	6	51
						1 0		1 0					27 0						1 0				6 0				1 0	57	57	0	0.0	13	52
						1 0		1 1			1 0			10 0		1 0											4 0	29	27	2	6.9	12	53
						15 0		4 3	2 0		3 0		1 0	83 0	2 0					1 0		1 0		2 0			1 1	145	138	7	4.8	21	54
	1 0					5 0		2 0	1 0	2 0	1 0			28 0			2 0		1 0						1 0		5 0	73	73	0	0.0	21	55
2 0						5 0		1 0	13 0		1 0			61 0					1 0	1 0		2 0		1 0	2 0		1 0	112	112	0	0.0	21	56
								2 0						6 0					1 0								1 0	15	15	0	0.0	7	57
								1 0			2 0		1 0	54 0					1 0									68	66	2	2.9	8	58
								1 1			1 0			57 0														67	65	2	3.0	6	59
2	0 1 0							0 1										103	0 1 0			1 0					1 0	151	147	4	2.6	11	60
2	0 2 0							3 3	3 0					1 0		1 0		7	0 1	1					1 0			50	45	5	10.0	17	61
1	0																	42	0 1 0			1 0						56	56	0	0.0	8	62
2	0																1 0		57 0								1 0	67	67	0	0.0	8	63
	1 0																		96 3								1 0	107	103	4	3.7	5	64
2	0																		72 0								1 0	77	77	0	0.0	5	65
								1 1					2 0							18 1			1 0					47	45	2	4.3	10	66
	1 0				1 0			0 1													4 0							18	15	3	16.7	9	67
2	0							0 1	3 0													64 6		1 0				84	81	3	3.6	11	68
									1 0		1 0											87 1		12 0			1 0	113	111	2	1.8	8	69
													1 0										19 0				1 0	35	34	1	2.9	5	70
	1 0					0 1					3 0						1 0						1 0		53 0		1 0	77	76	1	1.3	14	71
	1 0 1	0				2 0		3 4		1 0	4 1		1 0				1 0		1 0				1 0 1	0	40 0		1 1	86	78	8	9.3	19	72
														1 0									1 0					6	6	0	0.0	5	73
								1 0		4 3	1 0																	21	17	4	19.0	9	74
											1 0			1 0														9	8	1	11.1	7	75
											2 0					1 0												10	9	1	10.0	7	76
																												0	0	0	0.0	0	77
1	0																						1 0					11	11	0	0.0	6	78
	3 0							4	3 1	0 0	1 2	0		1 0					1 0			1 0			1 0			39	34	5	12.8	19	79
					1 0		1 0	1	0 2	0		1 0	1	3 0					1 0			1 0 1	0					37	36	1	2.7	19	80
					0 1																	0 1						2	0	2	100.0	2	81
								1 0						1 0														9	6	3	33.3	6	82
1	0 8 0		1 0		0 1	7 7		192	256	1 0	8 4	46	34	1 0		3 0	7 0		3 3		4 2		10 0	1 0	4 0	2 0		5 1	1,006	524	482	47.9	35	83
														1 0									1 0					14	13	1	7.2	5	84
1	0							4	8					1 0													1 0	89	23	66	74.2	8	85
						2 1		45	23			46	10						37	2					11 0			202	155	47	23.3	9	86
77	230	3	102	0	9	65	2	676	126	34	417	66	42	278	12	63	26	155	313	25	4	170	54	26	132	4	51	6,473	....	...	....	..	87
77	230	3	96	0	6	54	2	339	125	26	371	66	42	277	12	63	23	155	305	24	4	168	54	26	132	4	48	....	5,716	...	....	..	88
0	0	0	6	0	3	11	0	337	1	8	46	0	0	1	0	0	3	0	8	1	0	2	0	0	0	0	3	....	....	757	....	..	89
0.0	0.0	0.0	5.9	0.0	33.3	16.9	0.0	49.8	0.8	23.5	11.0	0.0	0.0	0.4	0.0	0.0	11.5	0.0	2.6	4.0	0.0	1.2	0.0	0.0	0.0	0.0	5.9	....	....	...	11.7	..	90
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

practice medicine in 1951 and who thus represent additions to the medical profession in the United States and its territories and outlying possessions.

The greatest number of licenses issued in 1951, both by examination and by endorsement of credentials, was granted by California. This state issued 1,367 licenses. New York issued 1,107, and more than 500 physicians were registered in Illinois, Ohio, Pennsylvania, and Texas. The fewest number were licensed in Nevada (13), while the states of Idaho, Maine, Montana, New Hampshire, North Dakota, Rhode Island, South Dakota, Vermont, and Wyoming issued less than 50 licenses.

There was a decrease of 201 in the total number of licenses issued in 1951 as compared with the previous year. This decrease was the result of fewer licenses issued by endorsement of credentials. There was an increase of 259 in the number of physicians registered after written examination.

Totals of the physicians licensed for 16 previous years and for 1951, both by examination and reciprocity, are

included in table 3. The variations shown for the years from 1936 to 1941 inclusive were due to the increase in the licensure of foreign-trained physicians. The increases in recent years resulted from the increase in the production of physicians in the United States, the mobility of physicians and also from the licensure of foreign-trained physicians.

TABLE 3.—*Licenses Issued, 1935-1951*

	Examination	Reciprocity and Endorsement	Total
1935	5,725	2,194	7,919
1936	6,276	2,773	9,049
1937	6,629	3,205	9,834
1938	6,557	2,956	9,513
1939	6,400	2,872	9,272
1940	6,289	2,866	9,155
1941	6,057	2,762	8,819
1942	6,152	2,469	8,621
1943	6,062	2,340	8,402
1944	7,080	2,596	9,676
1945	5,580	3,622	9,202
1946	6,567	9,669	16,236
1947	6,763	7,701	14,464
1948	5,997	7,595	13,592
1949	5,252	6,929	12,181
1950	5,454	6,755	12,209
1951	5,713	6,295	12,008
Totals	104,553	75,599	180,152

In 17 years, 1935 to 1951, the number of medical licenses issued in the United States totaled 180,152, 104,553 after written examination and 75,599 by endorsement of credentials.

Candidates Examined by Medical Examining Boards

Compilations referring to those examined in 1951 by individual states, the District of Columbia, Alaska, Hawaii, Puerto Rico, and the Virgin Islands, indicating the number who passed and failed in each state, the medical school of graduation, the percentage of failures for each school, as well as each licensing board and the number of states in which graduates of a given school were examined are recorded in table 2. Medical schools in the United States which are no longer in operation, unapproved medical schools in the United States, foreign faculties of medicine, and schools of osteopathy are not listed by name, but the numbers examined in each state in these four categories are included following those for existing medical schools in the United States and Canada.

TABLE 4.—*Source of Candidates Examined for Licensure in the United States, 1951*

Medical Schools	Number of Schools	Number Examined	Number Passed	Number Failed	Percentage Failed
Approved in United States	72	5,018	4,874	144	2.9
Approved in Canada	9	144	127	17	11.8
Extinct	5	14	13	1	7.2
Foreign	146	1,006	524	482	47.9
Unapproved Schools	5	89	23	66	74.2
Schools of Osteopathy	7	202	155	47	23.3
	244	6,473	5,716	757	11.7

During 1951 there were 6,473 applicants for licensure by written examination, of whom 5,716 passed and 757, or 11.7%, failed. The candidates examined represented 72 approved medical schools in the United States, 9 approved medical schools of Canada, 5 United States medical schools now extinct, 142 faculties of medicine, and 4 licensing corporations of foreign countries, 5 unapproved medical schools in the United States and 7 schools of osteopathy. Osteopaths who were granted the privilege to practice medicine, surgery, or both, by medical examining boards are included in these statistics. Osteopaths who obtain the legal right to special practice by other than medical examining boards are not included in these compilations. One medical school in Canada had none of its graduates examined in the United States in 1951.

Examination and reciprocity meetings are scheduled at frequent intervals by licensing boards in most of the states to facilitate licensure and enable physicians to commence the practice of medicine without undue delay. Later in this study there is included a tabulation giving the schedules for all states. The publication of the dates of examinations and reciprocity or endorsement meetings is a regular biweekly feature of THE JOURNAL.

The 6,473 examinees (table 4) included 5,018 graduates of approved medical schools in the United States, of whom 2.9% failed; 144 graduates of approved medical schools in Canada, 11.8% of whom failed; 14 graduates of medical schools in the United States which are now extinct with 7.2% failures; 1,006 graduates of faculties of medicine located in countries other than the United States and Canada, 47.9% of whom failed; 89 graduates of unapproved medical schools in the United States, none of which are now in existence, with 74.2% failures, and 202 graduates of schools of osteopathy with 23.3% failures.

TABLE 5.—*Graduates of Medical Schools in Canada Examined for Licensure in the United States, 1951*

	Examined	Passed	Failed
Alabama	1	1	0
California	20	20	0
Connecticut	4	4	0
District of Columbia	1	1	0
Florida	8	3	5
Georgia	1	1	0
Idaho	1	1	0
Illinois	9	8	1
Indiana	6	6	0
Iowa	2	2	0
Louisiana	2	2	0
Maine	8	6	2
Maryland	3	3	0
Massachusetts	4	4	0
Michigan	8	8	0
Minnesota	13	13	0
Mississippi	1	1	0
Missouri	3	3	0
New Hampshire	2	1	1
New Mexico	1	1	0
New York	10	7	3
North Carolina	3	3	0
North Dakota	8	4	4
Ohio	7	7	0
Oklahoma	1	1	0
Pennsylvania	6	6	0
Rhode Island	1	1	0
South Carolina	1	1	0
Texas	2	2	0
Virginia	3	2	1
Washington	3	3	0
Wisconsin	1	1	0
Totals	144	127	17

As in table 1, the 6,473 physicians and others examined for medical licensure do not represent an equal number of persons, since a candidate tested in more than one state in a calendar year is counted in each state. However, if a candidate failed more than once in a given state within the year, he is counted in that state as a single failure. Figures which show the number of individual licentiates added to the medical profession in 1951 are given in tables 12, 13, and 14.

The greatest number of graduates from any one school examined was 175, representing the University of Illinois

College of Medicine, 114 of whom were tested in Illinois and 61 in 19 other states. The greatest number examined from private medical schools was 155, representing Northwestern University Medical School. Graduates of this school were tested in 22 states, 76 being examined in Illinois, where the school is located. Fourteen other schools had more than 100 of their graduates examined for medical licensure throughout the United States in 1951 as follows:

	No. of Examinees	No. of States in Which Examinations Were Taken
University of Tennessee	151	11
Tulane University	147	6
Jefferson Medical College	145	21
University of Michigan	127	7
St. Louis University	126	10
Indiana University	125	9
Washington University	116	9
Medical College of Virginia	113	8
University of Minnesota	108	12
University of Pennsylvania	112	21
University of Texas	107	5
University of Louisville	104	8
Louisiana State University	101	6
University of Cincinnati	101	8

Yale University with eight examinees, Buffalo with seven, Boston University with six, and Albany Medical College with five examinees represented schools with the fewest number of applicants for medical licensure by written examination before state boards. The majority of graduates of these four schools are licensed by endorsement of the certificate of the National Board of Medical Examiners.

The University of Washington School of Medicine appears for the first time in state board tabulations in 1951, although the school graduated its first class in 1950. Last year there were 35 graduates examined in 5 states, of whom 34 passed and 1 failed.

Nineteen approved schools in the United States had no failures before medical licensing boards, 35 less than 5% and 10 between 5 and 10%. There were eight schools with 10% or more of failures in state examinations. The over-all figures and percentages for failures are modified by including data on those who were examined by the National Board of Medical Examiners in its final examination as well as those who took the examinations of state boards (table 6).

There were 144 graduates of nine approved medical schools in Canada tested for medical licensure in 1951 in 31 states and the District of Columbia. The figures are given for each licensing board by school in table 2 and by totals in table 5. Of the 144 candidates, 127 passed and 17, or 11.8%, failed.

Graduates of foreign faculties of medicine were examined by 35 boards. There were 1,006 examined, of whom 524 passed and 482, or 47.9%, failed. Graduates of five unapproved medical schools were examined by eight boards. There were 89 examined of whom 23 passed and 66, or 74.2%, failed. Graduates of schools of osteopathy were tested in nine states. Represented were 202 graduates, of whom 155 passed and 47, or 23.3 per cent failed. Fourteen graduates of five approved medical schools in the United States no longer in operation were tested in 5 states, of whom 13 passed and 1 failed.

TABLE 6.—*Consolidated Results of Examinations, State Medical Examining Boards and the National Board of Medical Examiners, 1951*

School	Results of Medical Examining Board Tests		Part III Examination of National Board of Medical Examiners		Total Examined	Totals		Percentage Failed
	P	F	P	F		P	F	
Medical College of Alabama	62	4	6	0	72	68	4	5.6
University of Arkansas	89	4	0	0	93	85	4	4.3
College of Medical Evangelists	88	3	35	0	126	123	3	2.4
Univ. of Southern California	58	2	3	0	63	61	2	3.2
University of California	78	1	0	0	79	78	1	1.3
Stanford University	60	2	6	0	68	66	2	2.9
University of Colorado	59	1	3	0	63	62	1	1.6
Yale University	8	0	43	0	51	51	0	0.0
Georgetown University	12	0	77	0	89	89	0	0.0
George Washington University	15	1	74	2	92	89	3	3.3
Howard University	55	6	10	0	71	65	6	8.5
Emory University	88	1	8	0	97	96	1	1.0
Medical College of Georgia	89	3	0	0	92	89	3	0.0
Chicago Medical School	43	5	4	0	52	47	5	9.6
Northwestern University	152	3	23	0	178	175	3	1.7
Stritch School of Medicine	78	4	8	0	90	86	4	4.4
University of Chicago	43	1	29	1	74	72	2	2.7
University of Illinois	170	5	31	0	206	201	5	2.4
Indiana University	120	5	3	0	128	123	5	3.9
State University of Iowa	80	1	11	0	92	91	1	1.1
University of Kansas	93	1	1	0	95	94	1	1.1
University of Louisville	102	2	6	0	110	108	2	1.8
Louisiana State University	101	0	0	0	101	101	0	0.0
Tulane University	146	1	10	0	157	156	1	0.6
Johns Hopkins University	74	0	15	1	90	89	1	1.1
University of Maryland	91	1	4	0	96	95	1	1.0
Boston University	6	0	52	0	58	58	0	0.0
Harvard Medical School	39	0	103	1	143	142	1	0.1
Tufts College Medical School	16	2	92	3	113	108	5	4.4
University of Michigan	125	2	12	0	139	137	2	1.4
Wayne University	65	1	0	0	66	65	1	1.5
University of Minnesota	108	0	4	0	112	112	0	0.0
St. Louis University	125	1	11	0	137	136	1	0.7
Washington University	114	2	12	0	128	126	2	1.6
Creighton University	64	5	11	0	80	75	5	6.2
University of Nebraska	82	5	6	0	93	88	5	5.4
Albany Medical College	4	1	51	1	57	55	2	3.5
State University of New York, New York City	23	7	96	1	127	119	8	6.3
University of Buffalo	6	1	66	0	73	72	1	1.4
Columbia University	25	1	90	2	118	115	3	2.5
Cornell University	28	3	39	0	70	67	3	4.3
New York Medical College	18	0	93	7	118	111	7	5.9
New York University	26	3	103	4	136	129	7	5.1
University of Rochester	23	2	44	0	69	67	2	2.9
State University of New York, Syracuse	12	2	39	1	54	51	3	5.6
Duke University	27	0	55	0	82	82	0	0.0
Bowman Gray School of Med.	63	1	1	0	65	64	1	1.5
University of Cincinnati	99	2	1	0	102	100	2	2.0
Western Reserve University	80	0	5	0	85	85	0	0.0
Ohio State University	82	0	11	0	93	93	0	0.0
University of Oklahoma	72	0	0	0	72	72	0	0.0
University of Oregon	57	0	5	0	62	62	0	0.0
Hahnemann Medical College	27	2	74	3	106	101	5	4.7
Jefferson Medical College	138	7	22	0	167	160	7	4.2
Temple University	73	0	47	0	120	120	0	0.0
University of Pennsylvania	112	0	25	0	137	137	0	0.0
Woman's Medical College	15	0	26	0	41	41	0	0.0
University of Pittsburgh	66	2	5	0	73	71	2	2.7
Med. College of South Carolina	65	2	1	0	68	66	2	2.9
University of Tennessee	147	4	0	0	151	147	4	2.6
Meharry Medical College	45	5	2	0	52	47	5	9.6
Vanderbilt University	56	0	2	0	58	58	0	0.0
Southwestern Medical School	67	0	0	0	67	67	0	0.0
University of Texas	103	4	0	0	107	103	4	3.7
Baylor University	77	0	3	0	80	80	0	0.0
University of Utah	45	2	2	0	49	47	2	4.1
University of Vermont	15	3	16	0	34	31	3	8.8
University of Virginia	81	3	7	1	92	88	4	4.3
Medical College of Virginia	111	2	2	0	115	113	2	1.7
University of Washington	34	1	0	0	35	34	1	2.9
University of Wisconsin	76	1	2	0	79	78	1	1.3
Marquette University	78	8	7	0	93	85	8	8.6
Subtotals: U. S. Schools	4,874	144	1,655	28	6,701	6,529	172	2.2
University of Alberta	6	0	0	0	6	6	0	0.0
University of Manitoba	17	4	0	0	21	17	4	19.0
Dalhousie University	8	1	4	0	13	12	1	7.7
Queen's University	9	1	2	0	12	11	1	8.3
University of Western Ontario	11	0	4	0	15	15	0	0.0
University of Toronto	34	5	8	0	47	42	5	10.6
McGill University	36	1	21	1	59	57	2	3.4
University of Montreal	0	2	3	0	5	3	2	40.0
Laval University	6	3	0	0	9	6	3	33.3
Subtotals: Canadian Schools	127	17	42	1	187	169	18	9.6
Extinct Medical Schools	13	1	0	0	14	13	1	7.2
Unapproved Medical Schools	23	66	0	0	89	23	66	74.2
Schools of Osteopathy	155	47	0	0	202	155	47	23.3
Foreign Medical Faculties	524	482	11	1	1,018	535	483	47.4
Totals	5,716	757	1,708	30	8,211	7,424	787	9.5

Elsewhere (tables 12, 13, and 14, pages 462 and 463) are given figures referring to actual licentiates and additions to the medical profession.

Consolidated Results of Examinations

A combination of the results by individual schools for two groups—those appearing before the state medical board examinations and those who took part 3 of the examinations of the National Board of Medical Examiners is given in table 6. This table represents a more accurate analysis of the performance of physicians from the individual schools in licensing examinations than those given in tables thus far presented. In some instances, it will be noted, schools having a high percentage of failures before state licensing boards had few, if any, failures before the National Board. In 1951 there were 5,018 graduates of approved medical schools in the United States examined by state boards, of whom 144, 2.6%, failed. In the same calendar year, 1,683 graduates of these institutions appeared for part 3 of the examinations of the National Board of Medical Examiners, of whom 28, or 1.6%, failed. For both groups the total examined was 6,701 and the percentage of failures was 2.2.

TABLE 7.—*Licensure Failures by Graduates of Existing Approved Medical Schools in the United States Located in the State Where Examined and Elsewhere, 1951*

States with Four Year Medical Schools	Total No. Examined	No. Failures of Schools in State	No. Schools in State Represented at Examinations	Per Cent Failed	No. Failures of Schools Out of State	No. Schools Out of State Represented at Examinations	Per Cent Failed	Per Cent Failed in All U. S. Schools
Alabama	62	2	1	3.2	0	6	0.0	3.2
Arkansas	87	4	1	4.6	0	2	0.0	4.6
California	554	5	4	0.9	9	47	1.6	2.5
Colorado	85	0	1	0.0	1	9	1.2	1.2
Connecticut	50	0	1	0.0	2	10	4.0	4.0
Dist. of Columbia	29	0	2	0.0	0	9	0.0	0.0
Georgia	147	0	2	0.0	0	6	0.0	0.0
Illinois	510	2	5	0.3	7	30	1.3	1.7
Indiana	119	2	1	1.7	0	6	0.0	1.7
Iowa	81	1	0	0.0	0	4	0.0	0.0
Kansas	92	0	1	0.0	0	8	0.0	0.0
Kentucky	104	0	1	0.0	0	7	0.0	0.0
Louisiana	217	0	2	0.0	0	19	0.0	0.0
Maryland	188	0	2	0.0	0	15	0.0	0.0
Massachusetts	114	0	2	0.0	4	14	3.5	3.5
Michigan	222	0	2	0.0	0	24	0.0	0.0
Minnesota	166	0	1	0.0	0	18	0.0	0.0
Missouri	230	0	2	0.0	0	15	0.0	0.0
Nebraska	102	1	6	1.9	0	1	0.0	1.0
New York	676	15	8	2.2	32	32	4.7	6.9
North Carolina	126	1	2	0.8	0	20	0.0	0.8
Ohio	417	1	3	0.2	1	21	0.2	0.4
Oklahoma	66	0	1	0.0	0	0	0.0	0.0
Oregon	42	0	1	0.0	1	11	2.4	2.4
Pennsylvania	278	0	6	0.0	1	14	0.3	0.3
South Carolina	63	0	1	0.0	0	4	0.0	0.0
Tennessee	155	0	3	0.0	0	2	0.0	0.0
Texas	313	3	3	0.9	1	30	0.3	1.2
Utah	25	1	1	4.0	0	5	0.0	4.0
Vermont	4	0	1	0.0	0	0	0.0	0.0
Virginia	170	1	2	0.6	0	4	0.0	0.6
Washington	54	0	1	0.0	0	12	0.0	0.0
Wisconsin	132	0	2	0.0	0	15	0.0	0.0
Subtotals	5,680	39	72	0.6	59	420	1.0	1.7
States Without Four Year Medical Schools								
Arizona	14				0	10	0.0	
Delaware	14				1	9	7.2	
Florida	427				39	62	9.0	
Idaho	8				0	4	0.0	
Maine	21				0	7	0.0	
Mississippi	77				0	21	0.0	
Montana	3				0	3	0.0	
Nevada	0				0	0	0.0	
New Hampshire	9				1	6	11.1	
New Jersey	65				3	17	4.6	
New Mexico	2				0	1	0.0	
North Dakota	34				0	8	0.0	
Rhode Island	12				0	3	0.0	
South Dakota	26				0	12	0.0	
West Virginia	26				0	9	0.0	
Wyoming	4				0	4	0.0	
Alaska, Hawaii and Puerto Rico	51				2	29	3.9	
Subtotals	793				46	205	5.7	

Of the National Board of Medical Examiners, 6,701 and the percentage of failures was 2.2.

There were 189 graduates of approved medical schools in Canada examined by both state boards and the National Board in 1951, 11.7% failed state board tests and 2.3% failed the National Board examinations. For both groups 9.6% failed.

The National Board did not examine in 1951 a graduate of an approved medical school no longer in operation. The National Board does not admit to its examinations the graduates of unapproved medical schools in the United States or schools of osteopathy. Only 12 graduates of foreign medical faculties were admitted to the National Board's final examination, while 1,006 were examined by state licensing boards.

The total of all examined before medical licensing boards, as shown in table 6, was 6,473, of whom 5,716 passed and 757, or 11.7%, failed. For both groups—state boards and the National Board—8,211 were examined, 7,424 passed, and 787, or 9.5%, failed.

Failures in Medical Licensure Examinations

Failures before medical licensing boards by graduates of existing approved medical schools in the United States are recorded in table 7. In this compilation the United States is divided into two groups—the 32 states and the District of Columbia, in which approved four year medical schools are located, and those states and the territories and outlying possessions which had no four year medical school within their boundaries in complete operation in 1951. The figures include the total number examined, the number who failed state board examinations and were graduates of a medical school located in the state in which they were examined, and the number of failures in a given state who obtained their professional training in schools in other states.

In general, state licensing boards require the applicant to receive a general average of 75% and at least 60% in any one subject. In case of failure in not more than two subjects, the applicant is permitted a second examination in those subjects within 12 months. A few states consider such persons as conditioned in the subjects in which they fail. Conditioned candidates are not counted as failures in this study. When their grades are raised after a successful examination they are recorded among those who passed.

The physicians who failed examinations in the state in which they obtained their professional training numbered 39. This occurred in 13 states. There were 59 failures reported by 10 states among physicians who graduated from approved medical schools located in states other than the one in which they were examined. Fifteen states had no failures in either group, while five states had failures in both groups.

In the 16 states and the territories and outlying possessions which do not have four year medical schools in operation, five boards reported 46 failures.

The data pertaining to licensure failures are further subdivided in table 8 by the number of candidates who were licensed after previously failing a licensing examination. The figures are presented for four categories—

approved medical schools in the United States and Canada, foreign faculties of medicine, unapproved medical schools, and schools of osteopathy. These groups are classified according to the number licensed after failing a state board examination once and after two or more failures. The table further indicates whether the single and multiple failures have been in the state where licensed or elsewhere. The total number of candidates 78 were licensed after one failure elsewhere. Forty-two received licenses after more than one failure.

In the group of foreign medical faculties, 265 graduates were licensed after previous failure. One hundred and forty had more than one previous failure. Also, 21 graduates of unapproved medical schools and 29 graduates of schools of osteopathy were registered after previous failure.

TABLE 8.—*Failures Before Medical Licensing Boards by Licentiates, 1951*

	Licenses Issued by Examination, Reciprocity or Endorsement	Approved Schools					Foreign Schools					Unapproved Schools					Schools of Osteopathy					Total Failures by Licentiates, 1951
		Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			
		Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	
Alabama	128	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Arizona	74	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	3
Arkansas	129	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
California	1,367	11	15	1	6	..	6	3	1	..	..	..	..	..	..	..	..	..	..	..	..	43
Colorado	168	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Connecticut	228	2	2	..	1	..	1	1	1	1	..	..	..	..	..	..	..	..	1	..	..	10
Delaware	28	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
District of Columbia	166	1	1	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	4
Florida	329	15	2	..	..	..	..	..	1	1	1	1	1	..	..	5	..	..	..	..	..	27
Georgia	226	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	3
Idaho	43	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Illinois	665	3	1	..	..	..	18	2	11	..	2	..	..	..	..	1	..	..	..	..	..	38
Indiana	238	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	4
Iowa	162	1	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	4
Kansas	185	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Kentucky	183	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Louisiana	303	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Maine	45	..	1	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	3
Maryland	268	..	..	..	..	..	2	..	..	3	1	..	..	..	..	..	..	..	..	..	..	6
Massachusetts	299	2	..	1	..	..	1	1	..	..	1	..	..	2	..	..	..	1	2	..	..	11
Michigan	417	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Minnesota	300	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Mississippi	130	..	1	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	3
Missouri	356	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	3
Montana	41	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Nebraska	129	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Nevada	13	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
New Hampshire	47	..	1	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	4
New Jersey	329	..	5	..	2	1	..	5	..	3	..	..	..	..	..	..	..	4	..	1	..	21
New Mexico	54	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
New York	1,107	20	6	10	..	..	55	1	77	1	6	1	..	2	..	1	7	..	3	..	..	190
North Carolina	238	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
North Dakota	42	..	1	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	4
Ohio	664	1	6	..	2	..	12	5	4	7	2	..	..	..	..	..	5	..	..	..	..	44
Oklahoma	128	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Oregon	117	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Pennsylvania	549	..	5	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	6
Rhode Island	40	..	..	..	1	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	4
South Carolina	118	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
South Dakota	46	..	..	..	..	1	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	4
Tennessee	253	..	1	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Texas	632	3	3	1	..	..	..	..	..	..	..	..	3	1	..	..	2	..	..	..	..	13
Utah	64	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Vermont	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Virginia	291	1	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Washington	188	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
West Virginia	99	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Wisconsin	216	..	3	..	1	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	6
Wyoming	27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Alaska, Hawaii, Puerto Rico, Virgin Islands, Guam and Canal Zone	94	3	2	1	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	8
Totals	12,008	68	78	15	25	2	100	25	96	31	13	2	6	5	1	7	14	7	6	2	0	503

licensed after examination or by endorsement of credentials is shown and also the total number of failures in all groups.

Of the 12,008 licenses to practice medicine issued in 1951, 503 were granted to applicants who had previously been unsuccessful before a licensing board. All physicians licensed in 1951 in eight states had no failures in a state board examination.

From the approved schools, 188 graduates had previously failed a state board examination. Sixty-eight had one failure in the state in which they were licensed, while

Five physicians had more than 10 failures before securing licenses. One of these was a graduate of a foreign medical school who had 11 failures, and 4 were graduates of unapproved medical schools in the United States. Three had 11, 12, and 13 failures, respectively, while one physician was licensed after 34 failures in the state. This person has repeatedly been unsuccessful in examination tests since 1937. A few of the states have no restrictions on the number of examinations which may be taken prior to licensure, but most states have a set limit of three examinations.

Registration by Reciprocity and Endorsement

The reciprocity and endorsement policies in medical licensure in the United States, Alaska, Hawaii, Puerto Rico, Guam, and the Virgin Islands are summarized in table 9. Florida is the only state which requires all applicants for licensure to pass a written examination. Hawaii does not have reciprocal relations with any state but will endorse physicians certified by the National Board of Medical Examiners. Eighteen states, the District of Columbia, and Alaska require applicants for licensure without written examination to obtain a certificate from the board of examiners in the basic sciences. In the section of this report pertaining to basic science boards there is included a table outlining the reciprocity, endorsement, exemption, or waiver policies of these boards.

TABLE 9.—RECIPROCITY AND ENDORSEMENT

Marginal Number	The Examining Board of	Reciprocates with, or Endorses Certificates Granted by: Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	Marginal Number
1	Alabama	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
2	Arizona	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
3	Arkansas (regular board)	+	+	..	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	..	+	+	3
4	California	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
5	Colorado	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6	Connecticut (reg. & homeo. bds.)	..	..	..	..	..	..	..	+	..	..	+	..	+	..	+	..	+	+	+	+	+	..	..	..	..	..	..	+	..	..	6
7	Delaware (regular board)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	District of Columbia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Florida	No reciprocity or endorsement policies															..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	Georgia	+	..	+	+	+	..	..	+	..	..	..	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	10
11	Idaho	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11
12	Illinois	+	..	+	+	+	..	..	..	..	+	..	..	..	+	+	+	..	+	+	..	+	..	+	+	..	+	+	..	+	..	12
13	Indiana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
14	Iowa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14
15	Kansas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
16	Kentucky	+	..	+	+	+	..	+	+	..	+	..	+	+	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	16
17	Louisiana (reg. & homeo. bds.)	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	17
18	Maine	..	..	+	+	+	..	..	..	..	+	..	..	..	..	..	..	+	..	+	..	+	+	+	..	+	+	+	+	+	..	+	18
19	Maryland (reg. & homeo. bds.)	+	..	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	..	+	+	..	+	+	+	+	+	+	+	+	+	19
20	Massachusetts	+	..	..	..	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	..	..	+	+	+	+	+	..	..	+	..	20
21	Michigan	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	21
22	Minnesota	+	+[41]	+	+	+[41]	+[41]	+	..	..	+	+[41]	..	+[41]	+	+[41]	+	+	+	..	+	+[41]	..	+	+	+	+	+	+	+[41]	+	..	22
23	Mississippi	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	23
24	Missouri	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	24
25	Montana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25
26	Nebraska	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	26
27	Nevada	+	..	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	..	27
28	New Hampshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28
29	New Jersey	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	29
30	New Mexico	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	30
31	New York	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31
32	North Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32
33	North Dakota	+	..	+	+	+	..	..	..	..	+	..	+	+	+	+	+	+	+	..	..	+	..	..	+	+	+	+	+	+	+	+	33
34	Ohio	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	34
35	Oklahoma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35
36	Oregon	+	+	+	+	+	+	+	..	..	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	36
37	Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37
38	Rhode Island	..	+	+	+	+	+	..	+	..	..	+	+	+	+	+	+	..	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	38
39	South Carolina	+	..	..	..	..	..	+	..	..	+	..	..	+	..	+	+	+	+	..	+	..	+	+	+	..	+	..	+	..	+	+	..	39
40	South Dakota	+	+	+	+	+	..	..	..	..	+	..	..	+	+	+	+	+	..	..	..	+	+	+	..	+	+	+	..	..	..	+	40
41	Tennessee	+	+	+	+	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	..	+	+	+	+	+	41
42	Texas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	42
43	Utah	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	43
44	Vermont	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44
45	Virginia	+	+	+	+	+	+	+	..	+	..	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	45
46	Washington	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46
47	West Virginia	+	..	+	[38]	[38]	+	+	+	..	+	..	+	[38]	[38]	[38]	+	+	+	+	[38]	+	+	+	+	+	+	+	..	+	..	+	47
48	Wisconsin	+	+	+	+	+	+	+	..	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48
49	Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
50	Alaska	+	..	+	+	+	..	+	..	..	..	..	+	..	+	+	..	..	+	..	+	+	+	+	..	..	+	+	+	..	..	..	..	50
51	Guam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51
52	Hawaii	No reciprocal relations		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52
53	Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	+	..	..	+	..	..	..	..	..	53
54	Virgin Islands	No reciprocal relations		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	54

This summary should be supplemented by direct communication with the

Some states have additional requirements for graduates of schools outside the United States and Canada.

+, indicates reciprocal or endorsement relationships have been established; .. indicates no reciprocal or endorsement relationships have been established. (See column—"At the discretion of the board.")

1. 1st P, first papers required; ⊕, in citizenship column indicates full citizenship required, in other columns it implies a requirement.
2. In most cases there is a small additional recording or registration fee.
3. Year of practice after internship required.
4. Internship accepted in lieu of one year's practice.
5. Professional practice required.
6. All applicants must be graduates of a medical school approved by the American Medical Association.
7. Just preceding application.
8. No basic science reciprocity—examination must be within the state.
9. Basic science certificate required either by reciprocity or examination in addition to basic science subjects of National Board.
10. Canadian citizens are required to file first papers.
11. Not applicable to citizens of Canada.
12. Oral examination required when application is based on a license issued by some other state dated ten or more years prior to filing application.
13. Applicant must have resided in the state used as basis of application for one year after date on said certificate, or show two years of licensed practice in some other state.
14. Oral examination required.
15. Certificate used as the basis for application must be dated one or more years prior to filing application.
16. Actual practice for a period of three years immediately preceding date of application.
17. Practical, clinical examination required.
18. In lieu of its own examination, certificate of National Board may be accepted in whole or in part.
19. Regular and Homeopathic boards.
20. Reciprocity is extended to all states which accept Oregon licentiates on reciprocity basis.

Twenty-eight states, Alaska, and Puerto Rico have reciprocal agreements with specific states. In 21 states reciprocity is extended at the discretion of the licensing board. Sixteen states which have reciprocal agreements also have similar discretionary powers to endorse appli-

cants from nonreciprocating states who present credentials which correspond with those required by their respective states in the year issued.

There is also included in this table a column indicating the recognition accorded the certificate of the National Board of Medical Examiners. All states but Florida and Texas accept the National Board's certificate.

Additional requirements including professional practice, citizenship, oral examination and internship, and the fee for a license by reciprocity or endorsement are also recorded. In some states physicians of Canadian birth are exempt from the citizenship requirement. This is indicated by footnote. Few states will accept graduates of foreign faculties of medicine on a reciprocal basis. Other requirements or exemptions are indicated by footnotes.

This chart will be made available in reprint form. It is helpful to physicians who are considering a change in

POLICIES OF MEDICAL LICENSING BOARDS

Reciprocates with, or Endorses Certificates Granted by

Requirements

Marginal Number	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska	Puerto Rico	At the Discretion of the Board	National Board of Medical Examiners	Basic Science Certificate	Internship	Professional Practice	Citizenship [1]	Fees, Dollars [2]	Miscellaneous	Marginal Number
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	1[4]	⊕[11]	50	..	1
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕[8]	⊕	3[4,7]	1st P	100	42	2
3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	..	..	+[9]	..	..	1[4]	⊕	50[22]	42	3
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	1[13]	⊕[21]	100	12,15	4
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[43]	+[9]	..	⊕	1[4]	⊕	50	42	5
6	..	..	..	+	..	..	+	+	..	..	+	+	..	+	..	..	+	..	..	..	..	+	+[27]	⊕[10]	⊕	3[16]	1st P[10]	50	..	6
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[5]	..	⊕	2	⊕	100	..	7
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[27]	⊕	..	1[3]	..	50	..	8
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+	..	⊕	0	⊕	50	..	10
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	..	⊕	100	..	11
12	..	+	+	+	+	+	+	+	..	..	+	+	+	+	+	+	+	+	+	+	..	..	+[17]	..	⊕	1	1st P	25	17,42	12
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	1[4]	..	50	..	13
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	1[4]	⊕[11]	50	..	14
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	1[4,7]	⊕	50	42	15
16	..	..	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+	..	..	1[4]	⊕	50	42	16
17	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+[25]	..	..	1[4]	1st P[40,10]	50[23]	42	17
18	..	..	+	..	+	..	+	..	+	..	+	..	+	+	+	..	+	+	..	..	..	..	+	..	..	1[4]	..	50	..	18
19	+	+	..	+	+	+	+	..	..	+	..	+	..	+	+	..	+	..	+	+	..	+	+	..	..	1[4]	1st P	50	42	19
20	+[41]	+	..	+	+	..	+	+	+	..	+	+	+	+	+	..	+	+	..	..	..	+	+	..	..	0	1st P	50[28]	..	20
21	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+[33]	⊕[37]	⊕	1[4]	..	50	34	21
22	+[41]	+	..	+[41]	+	+	+	+[41]	..	+	+	+	+	+	+	+	+	+	+	+	..	+	+	⊕	..	0	1st P	75	17,42	22
23	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	..	..	⊕[41]	50	42,11	23
24	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+[27]	..	⊕[33]	1[4]	⊕	100	..	24
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	1[4]	⊕	75	14,42	25
26	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+[30]	⊕	..	1[4]	⊕	50	..	26
27	+	+	..	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	..	+	..	..	+	⊕	..	1[4]	⊕	200	14,42	27
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	0	⊕[11]	50	..	28
29	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	⊕	0	⊕	100	..	29
30	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	⊕	..	1[4]	1st P	50	..	30
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	2	1st P	30	..	31
32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	0	..	50	42,6	32
33	..	+	..	+	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	+	..	..	+	..	⊕	1	⊕	50[32]	14,42	33
34	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	..	1[4]	⊕	50	..	34
35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕[32]	⊕	1[4]	⊕	100	42,11,6	35
36	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+[9,27]	⊕	⊕	1[4]	⊕	100	..	36
37	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	2[24]	1st P	50	42	37
38	..	+	..	+	+	+	+	..	..	+	..	+	..	+	..	+	+	+	+	+	..	+[34]	+[14]	⊕	⊕	0	1st P	20	14	38
39	..	+	..	+	+	+	+	..	..	+	+	..	..	+	+	+	+	+	+	..	+	..	+[14]	..	⊕	1[4]	⊕	50	42	39
40	..	+	+	+	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	..	..	..	+	..	⊕	1	1st P	50	..	40
41	+	+	..	+	+	+	..	+	+	..	+	+	+	..	+	+	+	+	+	..	..	..	+[30]	⊕	⊕	..	0	⊕	50	42	41
42	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	⊕	⊕	0	..	50	..	42
43	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	⊕	3[1]	..	50	42	43
44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	1[3]	⊕	50	11	44
45	+	+	..	+	+	+	+	..	+	+	+	+	+	+	..	+	+	+	..	+	+	+	+	..	..	2[26]	1st P	50	..	45
46	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[8]	⊕[8]	⊕	0	..	25	..	46
47	..	+	+	+	+	+	+	[38]	+	+	+	+	+	+	+	..	..	+	+	+	..	..	+	..	..	0	⊕	100	..	47
48	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	..	+	..	+	+[14]	+[19]	⊕	⊕	1[29]	1st P	75[22]	6	48
49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	+[14]	..	⊕	0	⊕	50	..	49
50	..	+	+	+	+	..	..	..	..	+	+	+	+	+	+	+	+	+	..	..	..	..	+	⊕	⊕	0	⊕	100	6	50
51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	0	⊕	50	6	51
52	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	⊕	..	⊕	25	42,6	52
53	..	..	+	..	..	..	..	+	..	..	..	..	..	..	..	..	..	+	..	..	..	+[8,39]	+	..	⊕	1[3]	⊕	30	..	53
54	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	54

[1] secretary of the licensing board of the state in which the physician is interested.

21. Not required if country in which applicant is licensed will admit to practice citizens of the United States licensed to practice in some state or on proof of requirements similar to those required by California for graduates of foreign medical schools.
22. Fee same as applicant's state charges.
23. Oral examination required if applicant's state requires it.
24. If the applicant passes the examination in the state from which he transfers after the completion of his internship, no practice is required.
25. License in state with which Louisiana reciprocates required.
26. Internship accepted at the discretion of the board as the equivalent of two years' practice.
27. Fee, $25.
28. Fee for license on basis of National Board certificate, $25.
29. A two year internship is accepted.
30. Diplomates of National Board not required to have been in practice for three years.
31. Same as required of candidates of state applying for licensure.
32. Not required for licensure by reciprocity.
33. Reciprocity applicants only.
34. Supplemental examination required in certain cases when accepting the examination of a state with whom reciprocal relations have not been established.
35. May be licensed after a special (written) supplemental examination.
36. Fee, $50.
37. For matriculants after Oct. 15, 1937.
38. Licentiates of California, Colorado, Indiana, Iowa, Kansas, Massachusetts, and Rhode Island accepted on reciprocal basis at discretion of board.
39. Reciprocity extended at discretion of board to states having similar licensing requirements and which accept Puerto Rico licentiates on equal terms.
40. Permanent license withheld until completion of citizenship.
41. At the discretion of the board.
42. Graduates of foreign medical schools are not accepted.
43. Reciprocity extended at discretion of board to states having comparable licensing requirements and which accept Colorado applicants on a substantially equal reciprocal basis.
44. If registered after July 1, 1945.

TABLE 10.—*Candidates Licensed by Reciprocity and Endorsement of Credentials, 1951*

Source of Former License or Credentials

Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
States Issuing Licenses by Reciprocity or Endorsement	Total Licensed	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U.S. Govt. Services	National Board of Medical Examiners	Alaska, Hawaii and Puerto Rico	Canadian, Foreign	Special Exemption
Alabama	59	..	..	..	..	..	..	..	1	..	9	..	3	..	..	..	..	5	..	..	..	1	1	3	2	1	..	..	..	..	..	1	..	..	2	1	..	..	..	1	..	12	..	..	..	2	..	2	..	..	..	12	..	..	..
Arizona	60	..	..	1	1	2	..	1	..	..	..	..	5	3	3	..	2	1	..	..	..	4	10	..	3	..	5	..	..	1	..	..	..	..	..	2	..	..	4	..	..	..	1	2	..	..	2	..	..	2	..	..	5	..	..	..
Arkansas	46	..	..	..	..	..	..	..	..	..	..	..	1	..	..	3	1	3	1	2	1	2	1	1	3	..	..	..	..	1	..	2	1	..	..	4	..	1	..	..	..	12	1	..	..	..	1	..	..	1	..	..	3	..	..	..
California	844	1	4	4	..	23	3	1	3	5	3	1	95	26	6	6	5	15	2	24	2	37	53	2	24	..	20	..	1	10	..	40	3	3	45	7	11	35	1	2	12	16	8	2	7	12	3	20	..	18	216	2	..	3
Colorado	84	..	1	2	5	..	..	..	..	..	..	..	3	1	2	5	1	..	..	..	2	1	12	..	6	..	3	..	1	..	..	3	..	1	5	3	..	2	1	2	2	1	1	..	..	..	..	..	..	..	..	22	..	..	..
Connecticut	195	..	..	..	1	..	..	..	1	..	1	..	3	..	..	..	1	1	2	5	2	4	1	1	1	..	..	..	..	..	2	..	35	1	..	2	..	..	8	..	..	..	1	1	..	2	3	..	2	..	..	..	114	..	..	..
Delaware	15	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	5	1	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..	4	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Dist. of Columbia	139	..	..	..	3	..	..	..	..	..	..	..	4	2	..	..	..	2	..	15	..	..	..	..	2	..	..	..	1	2	..	4	1	..	3	..	..	7	..	..	..	1	2	..	..	4	..	2	1	..	..	76	3	4	..
Florida	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Georgia	80	1	..	..	4	..	..	..	..	..	..	..	3	1	..	..	3	5	..	7	..	2	2	..	1	..	1	..	..	..	..	..	6	..	1	2	..	1	..	4	..	7	1	..	..	6	..	..	..	..	..	21	1	..	..
Idaho	35	..	1	..	6	..	..	..	..	..	..	..	2	1	2	1	1	..	..	1	..	..	3	..	1	..	..	..	..	..	..	1	..	..	..	..	3	2	..	..	1	..	..	3	1	..	3	..	..	..	..	2	..	..	..
Illinois	203	..	..	..	4	1	..	..	1	..	2	..	..	12	6	5	2	4	..	6	..	10	..	..	16	..	4	..	..	1	..	1	1	1	10	2	..	8	..	..	..	4	4	2	..	1	2	1	9	..	..	83	..	..	..
Indiana	125	..	..	1	1	1	2	..	..	..	1	..	32	..	3	1	12	..	..	..	1	2	2	..	14	..	2	..	..	..	..	3	..	1	13	..	..	6	..	..	1	1	1	1	..	1	..	..	6	..	..	16	..	..	..
Iowa	85	1	..	2	3	3	..	..	1	..	1	..	8	1	..	2	2	1	1	1	..	3	7	..	3	..	13	..	..	..	..	3	..	..	3	..	..	5	..	..	..	..	..	..	..	1	1	..	1	..	..	17	1	..	..
Kansas	93	1	1	1	4	1	..	..	..	..	3	..	12	2	1	..	1	3	..	3	..	2	2	..	11	..	2	..	..	1	..	3	1	..	2	6	1	2	..	..	1	3	..	..	..	2	..	..	1	..	..	20	..	..	..
Kentucky	82	..	..	..	1	1	..	..	..	..	1	..	7	4	..	..	..	3	..	2	..	1	..	2	1	1	..	..	..	3	4	..	10	..	..	5	..	..	16	2	..	..	..	3	1	1	1	..	..	12	..	..	..
Louisiana	85	2	..	12	1	..	1	..	..	..	4	..	5	..	..	1	5	..	..	2	2	1	1	5	5	..	..	..	1	..	..	5	2	..	1	..	..	5	1	1	6	4	7	..	..	1	..	..	..	..	..	..	..	..	..
Maine	30	..	..	..	1	..	2	..	..	..	..	..	2	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	21	..	..	..
Maryland	122	1	..	..	5	1	2	..	10	..	6	..	4	3	1	1	1	..	2	..	..	1	..	1	1	..	1	..	..	..	..	4	2	..	3	..	..	8	..	1	..	..	1	1	..	..	7	..	2	..	..	51	1	..	..
Massachusetts	264	1	..	..	..	..	3	1	..	..	3	..	..	2	..	1	1	2	..	4	..	..	..	..	1	..	1	..	2	4	..	2	..	..	6	1	..	9	1	2	..	1	1	..	5	4	..	2	1	..	..	203	..	..	..
Michigan	214	..	..	3	9	1	1	..	..	..	1	..	25	9	2	6	5	2	..	8	4	..	5	2	9	1	6	..	..	3	..	4	2	2	16	3	1	11	..	..	..	..	8	4	1	..	2	3	..	9	..	..	46	..	..	..
Minnesota	134	1	..	..	5	2	..	..	..	..	2	1	..	6	5	..	5	2	1	..	..	7	..	..	7	..	5	..	..	1	..	3	1	..	5	1	..	3	..	..	..	1	10	..	..	..	7	2	..	2	..	..	48	1	..	..
Mississippi	53	3	..	3	1	..	..	..	..	..	1	..	1	1	..	..	2	12	..	2	..	1	1	..	3	..	..	..	..	..	..	..	3	..	..	..	..	1	..	..	..	9	1	..	..	..	1	..	..	..	..	5	..	2	..
Missouri	128	..	..	2	3	2	..	..	..	..	1	..	11	1	1	22	2	4	..	3	2	6	3	1	..	..	4	..	..	..	..	1	1	..	4	2	..	4	..	..	..	4	8	..	..	2	1	..	4	..	..	29	..	..	..
Montana	38	..	..	..	3	3	..	..	..	..	..	1	4	..	..	1	1	..	..	..	..	2	3	..	4	..	2	..	..	..	..	2	..	..	1	..	..	1	2	2	..	2	..	..	..	..	2	2	2	..	..	2	..	..	..
Nebraska	33	1	..	1	..	1	..	..	1	..	..	..	6	1	4	1	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	..	1	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	9	..	..	..
Nevada	13	..	..	..	2	1	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
New Hampshire	41	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	2	..	..	..	1	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	22	..	3	..
New Jersey	275	..	..	..	2	..	..	1	1	1	..	..	2	3	..	1	..	2	..	7	..	1	2	..	2	..	3	..	..	..	..	6	..	..	1	1	..	38	..	4	..	..	3	..	1	4	..	..	1	..	..	126	..	..	..
New Mexico	54	..	..	1	2	2	..	..	..	..	3	1	..	2	..	3	1	..	..	1	1	2	2	..	..	..	..	..	..	..	..	2	..	1	5	2	..	1	..	..	..	3	4	..	..	..	..	4	..	..	6	..	..	..
New York	771	1	..	1	9	3	1	..	3	1	3	1	5	4	1	..	3	7	..	22	1	3	8	..	1	..	5	..	..	8	..	..	8	1	2	..	1	35	1	..	..	4	5	1	3	8	..	1	7	..	..	580	3	19	1
North Carolina	113	2	..	2	4	..	..	..	..	..	9	..	1	..	..	..	2	3	1	1	..	4	3	..	1	..	..	..	..	1	5	..	..	2	..	..	11	..	6	1	5	1	..	..	18	..	2	..	..	..	28	..	..	..
North Dakota	16	..	..	..	1	..	..	1	..	..	..	..	2	1	1	..	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	4	..	..	1
Ohio	312	2	..	..	7	2	..	..	2	..	1	1	18	9	1	3	7	3	4	10	..	19	6	1	29	..	4	..	..	4	..	26	2	1	..	2	..	29	2	..	1	8	3	1	4	5	..	4	3	..	..	87	1	..	..
Oklahoma	53	..	..	8	2	..	1	..	..	..	1	..	2	2	1	2	..	1	..	1	..	..	3	..	1	..	1	..	..	1	..	2	..	1	5	..	..	3	..	..	..	5	5	..	..	..	..	..	1	..	..	4	..	..	..
Oregon	75	..	..	..	9	4	..	..	..	..	1	3	2	3	..	..	2	..	..	2	..	1	8	..	1	..	3	..	..	..	..	..	..	..	2	2	..	1	..	..	..	2	1	..	..	5	..	2	..	..	21	..	..	..
Pennsylvania	272	3	..	..	6	..	3	1	2	1	..	..	8	6	..	..	4	2	..	16	..	10	3	..	2	..	2	..	..	7	..	13	4	1	11	..	..	..	..	1	..	3	2	..	1	1	..	6	4	..	4	147	..	..	..
Rhode Island	28	..	..	..	..	..	1	..	1	..	..	..	1	..	..	..	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	2	1	..	..	..	..	..	1	..	..	..	..	..	17	..	..	..
South Carolina	55	3	..	..	..	..	..	..	1	..	9	..	..	1	..	..	..	2	..	..	..	1	..	..	..	..	1	..	..	1	..	..	10	..	2	..	..	1	..	..	..	..	6	..	..	..	..	6	..	1	..	7	1	..	..
South Dakota	25	..	..	..	1	1	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	1	9	..	..	..	4	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	2	..	..	..
Tennessee	79	1	..	2	5	..	..	..	..	..	7	..	1	1	1	..	4	3	..	..	..	1	3	8	2	..	2	..	..	..	..	6	1	..	2	1	..	4	..	..	..	2	..	..	3	..	1	3	..	..	14	1	..	..
Texas	325	3	..	9	6	6	1	..	2	..	8	..	66	13	4	12	13	30	..	5	3	6	11	6	21	..	2	..	..	1	..	12	1	..	13	9	1	17	..	3	..	19	..	..	1	10	1	1	5	..	1	3	..	..	..
Utah	37	..	..	..	4	2	..	..	..	..	1	4	1	..	..	..	..	..	..	3	..	2	..	..	1	..	1	..	..	..	..	1	1	..	2	..	2	3	..	..	..	3	..	..	..	..	..	..	..	..	..	6	..	..	..
Vermont	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	..	1	..
Virginia	123	..	..	2	1	..	..	1	6	..	5	..	2	..	1	..	3	2	..	14	..	5	..	..	..	..	1	..	..	1	..	6	6	..	4	..	..	3	..	5	..	2	1	..	1	..	1	5	2	..	1	42	..	..	..
Washington	136	1	..	..	18	1	..	..	..	..	..	..	4	1	3	1	2	4	..	3	..	3	10	..	14	1	10	..	..	..	..	5	..	..	3	1	8	3	..	..	1	2	1	1	..	1	..	2	..	..	31	..	1	..
West Virginia	73	..	..	1	1	1	..	1	..	..	1	..	1	2	..	1	5	..	..	5	..	2	3	..	..	..	..	..	..	..	..	..	..	..	3	..	..	9	..	1	..	3	1	..	..	13	..	..	1	..	..	18	..	..	..
Wisconsin	87	..	..	..	1	2	..	1	1	..	..	..	12	1	..	1	1	1	..	4	..	6	6	..	1	..	..	..	..	..	..	1	1	..	..	..	..	2	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..
Wyoming	23	..	..	..	1	3	..	..	..	..	..	..	5	1	1	1	..	1	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	37	..	..	5
Alaska, Hawaii, Puerto Rico, Virgin Islands, Guam, Canal Zone	50	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	1	..	..	3	..	..	..	..	..	..	1	..	..	1	..	1	3	..	..	..	..	2	..	..	1	1	..	1	..	..	26	..	..	5
Totals	6,295	29	7	58	144	70	21	9	37	8	83	7	378	127	55	82	99	132	14	186	27	157	188	31	200	5	112	0	9	53	1	282	64	15	198	53	30	301	9	32	15	167	96	20	22	125	40	37	105	0	61	2,234	15	30	15
Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55

location. The facts recorded in this table are intended to present merely general statements of licensure policies. The information here given should be supplemented by direct communication with the licensing boards. A list of the executive officers in charge of medical licensure appears elsewhere in this study.

The procedure in issuing licenses by reciprocity or endorsement varies. Some states entertain applications for licensure at any time, while others hold monthly, quarterly or semi-annual meetings. The policy in effect in each state is contained in table 25 (page 469). In addition, THE JOURNAL publishes biweekly the exact dates when reciprocity or endorsement applications are considered.

The credentials presented by physicians granted licenses to practice medicine without written examination are given in table 10. There were 6,295 so registered on the basis of licenses from other states, the District of Columbia, the territories or outlying possessions of the United States, Canada, and foreign countries, the certificate of the National Board of Medical Examiners, by special exemption and by acceptance of service with an agency of the government of the United States.

California issued the greatest number of licenses by this method. In this state 844 were registered. New York licensed 771. Figures for other states were fewer than 325. Seven states licensed more than 200.

The largest number of candidates who presented the same type of credential were the 2,234 diplomates certified by the National Board of Medical Examiners. On the basis of the certificate of the National Board, 580 were licensed in New York, 216 in California, and 203 in Massachusetts. While the National Board reports Texas as one of the states which does not accept its certificate, three physicians were reported as licensed by endorsement of the National Board certificate in 1951. Delaware and Louisiana did not license any National Board diplomates by endorsement of the certificate last year.

There were 378 licenses issued in Illinois, 301 in Pennsylvania, and 282 in New York presented to other states for reciprocal registration. No physician holding a Nevada or a Wyoming license applied for registration by reciprocity in another state in 1951.

Five states registered 61 physicians by endorsement of credentials from one of the government services. Fifteen physicians were licensed in 10 states on the basis of a license issued in Alaska, Hawaii, or Puerto Rico; 30 in six states on the basis of Canadian or foreign credentials, and 15 by five boards were licensed by special exemption.

Table 11 records the number of individual schools represented by the 6,295 reciprocity licentiates. Every approved medical school in the United States and 9 of the 10 approved medical schools of Canada had graduates licensed without written examination in 1951. The 6,295 physicians registered without written examination in the United States in 1951 included 5,917 graduates of approved medical schools in the United States. No graduate of the University of Ottawa Faculty of Medicine in Canada applied for licensure in the United States in 1951. The University of Washington School of Medicine, which graduated its first class in June, 1950, had two of its graduates licensed by reciprocity in 1951. There were 214 graduates of Harvard Medical School licensed by reciprocity. More than 100 graduates of 25 schools secured such licenses. This table reflects the movement of physicians to states other than the one in which they obtained their professional training or in which they first established their practices.

One hundred and eight foreign-trained physicians obtained licenses by reciprocity or endorsement in 26 states and the territories and outlying possessions, and 65 graduates of medical schools no longer in operation were registered by 28 states. Fifty-two graduates of unapproved medical schools secured licenses in seven states and the territories and possessions, and 47 graduates of schools of osteopathy were registered in 8 states to practice medicine, surgery or both. There were 272 represented in these four groups. Thirty-four boards registered 106 graduates of Canadian medical schools.

Licentiates Representing Additions to the Medical Profession

Figures for the number of physicians who secured their first license to practice medicine and surgery in 1951 and who therefore represent additions to the medical profession in the United States and its territories and outlying possessions are presented in tables 12 and 13. Included in these compilations are figures pertaining to candidates examined and licensed in 1951, candidates who were examined in previous years but whose licenses were not issued until 1951 pending completion of a required internship, citizenship, or other technicalities, and physicians not previously licensed in any state who were certified during the year on the basis of the examinations of the National Board of Medical Examiners. The figures also include physicians licensed on the basis of governmental credentials and Canadian and foreign licenses. The majority represent recent graduates.

These official figures indicate that 6,325 persons were added to the physician population in 1951 in the United States, Alaska, Hawaii, Puerto Rico, Virgin Islands, Guam, and the Canal Zone. By reference to table 1 it can be noted that 12,008 licenses were issued during the year, indicating that 5,683 had previously been licensed. In 1951 there were about 3,700 deaths of physicians reported to the offices of the American Medical Association. When this figure is deducted from the number licensed in 1951 for the first time it will be seen that the net increase in the physician population in the United States and its territories and possessions was 2,625. The figure represents an increase of 417 in comparison with the net increase in 1950.

In analyzing table 12, it can be noted that New York had the greatest number of first licentiates, 743. California was second, with 526. Three states added more than 300 to their physician population, namely, Illinois 437, Ohio 394, and Pennsylvania 388. Increases as compared with 1950 [1] occurred in 26 states.

The 6,325 licentiates representing additions to the medical profession in the last calendar year included 4,985 who secured their licenses by examination and 1,340 by endorsement of credentials. The latter were mainly physicians certified by the National Board of Medical Examiners.

1. J. A. M. A. 146: 356 (May 26) 1951.

Marginal Number	SCHOOL	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine
	ALABAMA																		
1	Medical College of Alabama, Birmingham	3	..	..	2	..	..	..	..	..	2	..	..	..	1	1	..	1	..
	ARKANSAS																		
2	University of Arkansas School of Medicine, Little Rock	..	1	..	6	2	..	..	..	..	..	..	..	1	2	1	1	11	..
	CALIFORNIA																		
3	University of California School of Medicine, San Francisco	..	1	..	1	..	..	..	1	..	..	1	..	1	..	2	..	..	..
4	College of Medical Evangelists, Loma Linda-Los Angeles	..	2	..	6	7	..	..	3	..	4	3	1	..	1	..	..	..	..
5	University of Southern California School of Medicine, Los Angeles	..	1	..	3	..	..	..	..	..	..	1	1	..	..	..	..	..	..
6	Stanford University School of Medicine, Stanford University-San Francisco	..	..	..	4	2	1	..	1	..	..	1	1	..	..	..	..	..	..
	COLORADO																		
7	University of Colorado School of Medicine, Denver	..	2	..	19	2	..	..	..	..	..	1	..	1	..	1	1	..	..
	CONNECTICUT																		
8	Yale University School of Medicine, New Haven	..	..	1	5	1	23	..	2	..	1	1	2	..	1	2	1	1	..
	DISTRICT OF COLUMBIA																		
9	Georgetown University School of Medicine, Washington	..	..	..	12	1	5	1	20	..	1	..	2	1	..	..	..	..	1
10	George Washington University School of Medicine, Washington	1	..	..	11	2	1	..	25	..	1	..	3	..	2	2	..	..	1
11	Howard University College of Medicine, Washington	1	1	..	4	..	2	..	9	..	2	..	..	..	..	..	..	..	..
	GEORGIA																		
12	Medical College of Georgia, Augusta	4	..	..	1	..	1	..	..	..	..	..	1	..	..	2	1	2	..
13	Emory University School of Medicine, Atlanta	4	..	..	2	..	..	..	..	..	..	..	..	1	1	1	..	2	..
	ILLINOIS																		
14	Chicago Medical School	..	..	..	2	..	..	..	..	..	..	..	2	2	1	..	1	..	..
15	Northwestern University Medical School, Chicago	4	1	2	29	6	1	..	1	..	2	4	18	10	3	7	1	1	2
16	Stritch School of Medicine of Loyola University, Chicago	..	1	..	17	1	..	..	..	..	..	..	6	6	1	..	..	1	..
17	University of Chicago, The School of Medicine	1	3	..	12	..	..	..	3	..	..	..	6	5	1	..	..	..	..
18	University of Illinois College of Medicine, Chicago	..	1	..	58	1	2	..	2	..	1	..	11	15	5	6	2	3	..
	INDIANA																		
19	Indiana University School of Medicine, Bloomington-Indianapolis	..	3	..	26	1	..	..	2	..	1	1	13	..	1	2	3	..	..
	IOWA																		
20	State University of Iowa College of Medicine, Iowa City	..	4	..	11	2	..	..	..	..	..	2	9	..	6	1	..	..	..
	KANSAS																		
21	University of Kansas School of Medicine, Lawrence-Kansas City	..	..	3	7	5	1	..	..	..	..	..	4	1	2	..	..	1	..
	KENTUCKY																		
22	University of Louisville School of Medicine	..	1	1	8	1	1	..	..	..	3	1	2	12	1	1	2	5	..
	LOUISIANA																		
23	Louisiana State University School of Medicine, New Orleans	1	..	1	6	..	1	..	..	..	..	1	1	..	1	..	1	..	..
24	Tulane University of Louisiana School of Medicine, New Orleans	5	1	2	12	..	..	..	2	..	4	..	2	1	1	3	1	3	..
	MARYLAND																		
25	Johns Hopkins University School of Medicine, Baltimore	..	..	2	16	..	4	..	3	..	3	..	3	..	1	3	4	1	..
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	1	..	..	11	..	1	2	5	..	8	..	4	1	..	2	..	1	1
	MASSACHUSETTS																		
27	Boston University School of Medicine	1	..	..	5	1	8	1	2	..	1	..	..	..	..	1	1	1	1
28	Harvard Medical School, Boston	..	..	..	23	2	7	..	2	..	3	..	5	2	..	5	2	3	3
29	Tufts College Medical School, Boston	..	..	1	11	..	10	..	1	..	1	1	9	1	2	1	..	2	6
	MICHIGAN																		
30	University of Michigan Medical School, Ann Arbor	..	2	..	26	2	1	..	1	..	1	..	7	4	3	1	1	1	..
31	Wayne University College of Medicine, Detroit	..	1	2	13	..	3	..	..	..	..	..	3	..	..	..	1	..	..
	MINNESOTA																		
32	University of Minnesota Medical School, Minneapolis	..	7	1	40	7	..	..	..	..	..	2	1	3	5	3	..	1	..
	MISSOURI																		
33	St. Louis University School of Medicine	1	..	1	14	1	..	..	..	..	..	..	8	4	2	2	1	2	..
34	Washington University School of Medicine, St. Louis	..	3	2	17	4	1	..	2	..	..	2	8	1	2	8	1	3	..
	NEBRASKA																		
35	Creighton University School of Medicine, Omaha	..	3	..	7	..	..	..	..	..	..	..	1	2	5	..	1	..	..
36	University of Nebraska College of Medicine, Omaha	1	3	..	23	5	..	..	..	..	1	..	3	2	10	2	1	..	..
	NEW YORK																		
37	Albany Medical College	1	..	..	4	..	4	..	1	..	1	..	2	1	..	1	2	..	..
38	State University of New York College of Medicine at New York City	..	..	..	20	1	13	..	3	..	1	..	1	..	1	..	..	..	..
39	University of Buffalo School of Medicine	..	..	..	7	1	2	..	2	..	..	..	3	2	..	1	1	1	..
40	Columbia University College of Physicians and Surgeons, New York	..	..	..	17	1	17	..	3	..	1	1	2	1	1	3	5	1	1
41	Cornell University Medical College, New York	..	..	1	10	1	8	..	1	..	1	..	1	..	..	1	..	..	2
42	New York Medical College, Flower and Fifth Avenue Hospitals, New York	..	..	..	5	..	16	1	2	..	..	..	3	1	..	1	2	..	2
43	New York University College of Medicine, New York	..	..	1	30	1	13	..	2	..	1	..	2	2	..	1	1	2	..
44	University of Rochester School of Medicine and Dentistry	..	1	..	10	3	1	..	1	..	1	1	1	1	2	2	..	..	..
45	State University of New York at Syracuse College of Medicine	2	..	..	3	..	2	..	..	..	..	..	1	1	..	..	..	..	..
	NORTH CAROLINA																		
46	Duke University School of Medicine, Durham	3	..	1	4	..	3	1	1	..	4	..	1	..	2	..	2	..	..
47	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	..	..	..	2	..	..	..	..	..	1	..	1	..	..	..	1	..	..
	OHIO																		
48	University of Cincinnati College of Medicine	2	1	..	10	2	1	..	..	..	..	..	3	6	1	1	5	..	..
49	Western Reserve University School of Medicine, Cleveland	..	..	..	22	2	..	..	..	..	..	..	4	1	2	1	..	1	..
50	Ohio State University College of Medicine, Columbus	..	..	..	13	1	2	..	1	..	..	..	4	4	..	..	3	..	..
	OKLAHOMA																		
51	University of Oklahoma School of Medicine, Oklahoma City	1	..	3	8	3	..	..	..	..	2	..	2	..	..	7	..	..	..
	OREGON																		
52	University of Oregon Medical School, Portland	..	..	..	16	..	..	..	..	..	..	2	1	..	1	1	1	..	..
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Virgin Islands	Totals	Marginal Number
..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	2	..	..	..	1	..	..	..	..	17	1
..	..	3	..	3	2	..	1	..	..	..	1	2	2	..	..	7	..	..	..	..	..	2	9	..	..	2	..	1	..	..	..	60	2
2	..	3	..	..	..	..	..	..	..	1	..	3	..	..	2	1	..	2	..	..	..	..	..	..	..	..	2	..	..	..	..	23	3
2	1	3	2	3	3	1	1	..	..	..	..	2	1	..	3	1	6	1	..	..	..	6	3	..	..	..	5	2	..	1	5	79	4
..	..	..	3	..	1	..	..	1	..	..	1	1	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	..	1	..	..	17	5
..	..	2	..	..	..	1	..	1	..	..	..	4	..	..	1	..	1	..	..	..	..	..	1	1	..	..	1	..	1	..	..	24	6
1	..	1	2	..	1	2	..	1	..	..	2	4	1	..	1	..	4	1	..	..	1	..	2	2	..	..	1	1	..	3	..	58	7
4	11	2	..	..	3	..	..	..	1	2	..	7	..	..	6	1	..	5	1	..	..	2	2	..	..	1	2	..	..	..	..	91	8
17	6	..	..	..	..	..	..	..	..	12	..	15	1	..	5	..	..	12	1	1	..	..	1	..	..	11	..		..	..	2	128	9
14	2	2	4	..	2	..	1	..	..	4	1	6	5	..	5	..	..	4	1	..	..	1	3	1	..	12	5		2	..	2	127	10
..	2	3	1	1	..	..	..	..	..	2	..	7	2	..	1	..	..	5	..	..	..	..	..	..	..	2	..	..	1	..	2	48	11
1	2	..	1	..	..	..	..	..	..	..	..	2	3	..	..	..	..	..	..	4	..	4	6	..	..	2	..	1	..	..	..	38	12
6	..	1	2	1	1	..	..	..	..	..	1	2	6	..	3	1	..	..	..	2	..	3	2	..	..	3	..	..	..	..	..	45	13
..	..	..	..	1	..	1	..	..	..	1	..	6	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	18	14
2	..	8	3	..	6	3	3	..	1	1	4	4	..	..	5	4	4	4	..	1	1	3	10	1	..	..	8	..	1	2	4	175	15
..	..	6	2	..	..	..	2	..	..	2	3	1	..	..	4	1	1	..	..	..	..	1	5	..	..	..	..	..	2	..	1	64	16
2	..	4	2	..	..	1	1	..	..	1	1	5	1	1	2	1	1	3	1	..	..	..	2	3	..	..	3	1	3	..	1	71	17
..	..	9	1	..	8	1	1	..	1	..	..	4	1	1	5	1	3	3	..	..	1	..	5	1	..	1	3	3	11	2	..	173	18
3	2	9	6	..	1	..	1	..	..	2	1	6	..	2	8	2	1	6	..	1	..	1	11	1	..	..	2	1	2	1	2	125	19
1	..	2	5	..	3	1	..	1	..	1	..	2	..	2	4	1	2	1	..	..	..	2	2	..	..	1	5	..	3	2	1	77	20
1	1	6	..	..	21	1	1	1	..	1	1	..	..	..	2	2	..	..	..	..	2	..	12	..	..	..	1	2	..	..	..	79	21
1	1	5	5	2	3	..	..	1	..	1	..	7	2	..	7	..	..	5	..	..	1	4	8	..	..	3	2	4	1	..	1	103	22
1	1	..	1	5	2	..	..	..	1	..	..	1	2	..	1	..	..	..	..	..	..	1	8	..	..	..	..	..	..	..	..	37	23
1	1	2	1	8	3	1	..	..	..	2	3	8	2	..	3	2	2	1	..	3	..	4	25	..	..	2	2	1	1	1	1	117	24
3	3	5	..	2	3	..	..	..	2	2	1	13	2	..	6	1	..	6	..	1	..	..	2	2	..	6	3	2	1	..	..	106	25
2	1	3	1	..	..	..	..	..	..	2	..	10	..	..	4	..	2	7	1	4	..	..	3	1	..	7	..	4	..	..	1	90	26
2	31	2	1	..	..	..	..	..	4	2	..	20	1	..	2	1	..	5	2	..	..	..	2	..	..	1	1	..	1	..	..	101	27
6	44	11	6	1	4	..	..	..	3	4	1	37	3	..	11	1	1	8	3	1	..	2	1	1	..	2	2	..	2	..	2	214	28
1	59	3	3	..	2	..	..	..	5	3	1	6	..	..	4	..	..	2	8	..	..	..	2	..	1	4	..	..	..	..	..	150	29
1	1	1	2	2	5	..	..	1	..	2	1	7	3	..	15	..	2	7	..	1	1	1	2	2	..	3	2	2	6	..	..	120	30
1	1	1	1	1	1	1	..	..	..	..	1	2	1	..	1	..	..	1	..	..	..	..	1	..	..	3	..	..	1	..	1	42	31
..	..	2	5	..	1	2	2	1	..	2	1	6	2	1	3	2	6	2	..	..	6	2	6	..	..	..	5	2	7	..	..	136	32
1	2	6	5	1	1	3	..	..	..	3	..	4	..	..	18	1	1	..	2	..	..	2	11	1	..	..	8	1	2	..	3	112	33
1	..	5	3	3	3	1	1	..	..	..	1	2	1	..	10	1	2	1	1	..	..	1	7	..	..	..	11	1	..	2	1	113	34
..	..	4	2	..	2	..	6	..	..	1	..	4	..	..	1	..	1	2	..	..	..	1	..	..	..	..	4	..	..	..	..	47	35
1	1	5	4	..	2	2	3	..	..	2	1	4	..	2	6	1	3	1	..	1	4	1	2	1	..	2	8	..	..	2	..	110	36
..	2	..	..	..	..	..	..	..	..	4	..	38	..	..	2	..	..	1	..	..	..	..	..	..	1	..	1	..	..	..	..	46	37
..	1	2	..	..	1	..	1	1	1	18	2	59	1	..	5	..	..	8	..	..	..	..	2	2	1	1	1	1	..	..	..	148	38
..	5	2	4	..	1	..	..	..	1	2	..	51	2	..	5	..	..	2	..	..	..	..	..	..	1	1	1	2	..	..	..	100	39
3	7	3	2	..	2	..	2	..	4	23	2	79	3	..	4	..	1	5	..	2	..	2	..	..	..	..	4	..	1	..	1	204	40
2	2	2	1	..	3	..	1	..	..	18	1	24	3	..	5	1	1	5	..	..	..	1	3	..	1	3	3	1	..	..	..	107	41
1	5	3	2	..	..	..	..	..	..	19	..	50	..	1	7	1	..	5	..	..	1	..	3	..	..	..	..	1	2	1	..	135	42
1	2	3	1	..	..	1	..	..	2	21	..	72	3	..	8	2	..	10	2	..	..	1	3	..	..	3	1	2	2	..	1	197	43
..	3	3	1	..	2	..	..	..	1	3	..	27	..	..	4	..	1	2	..	1	..	1	2	2	..	3	2	..	..	..	..	82	44
..	2	4	3	..	1	..	..	..	2	1	..	17	..	..	2	..	..	3	..	..	..	..	1	..	1	..	..	..	..	..	..	46	45
4	..	5	2	..	..	..	..	..	..	1	1	5	8	..	5	..	..	2	..	4	..	..	..	..	1	4	..	1	1	..	2	68	46
..	..	2	..	..	..	..	..	..	..	1	..	2	..	..	..	..	..	2	..	4	..	..	..	1	..	2	..	..	..	..	..	19	47
1	3	6	2	..	..	..	..	1	..	..	2	2	2	..	..	..	..	4	..	..	..	1	4	..	..	1	1	2	..	..	..	64	48
1	2	5	1	1	1	..	1	..	..	2	1	2	..	..	1	..	..	2	..	..	1	..	5	1	..	1	1	1	1	..	1	65	49
1	1	5	1	..	2	..	..	..	..	..	2	1	..	..	..	..	2	4	..	2	..	..	1	..	..	2	1	..	..	..	..	53	50
..	1	2	3	..	2	..	1	1	1	1	2	1	..	..	2	..	2	..	..	..	..	1	10	..	..	..	2	..	1	..	..	59	51
1	..	..	2	..	1	2	..	..	..	1	..	1	..	..	..	..	11	..	..	..	1	..	1	..	..	..	10	..	1	..	1	55	52
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

Marginal Number	SCHOOL	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 Dist. of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine
	PENNSYLVANIA																		
53	Hahnemann Medical College and Hospital of Philadelphia	1	1	..	14	..	1	..	..	..	1	..	..	1	..	..	..	1	..
54	Jefferson Medical College of Philadelphia	..	2	2	18	..	6	1	5	..	1	2	3	4	2	1	2	4	..
55	Temple University School of Medicine, Philadelphia	..	..	1	12	2	2	1	1	..	..	..	4	1	1	..	3	1	..
56	University of Pennsylvania School of Medicine, Philadelphia	..	3	2	18	1	4	2	3	..	..	1	2	2	1	..	..	2	1
57	Woman's Medical College of Pennsylvania, Philadelphia	..	..	..	2	2	2	1	..	..	1	..	2	..	..	..	..	..	..
58	University of Pittsburgh School of Medicine	..	1	..	6	2	1	..	..	..	1	..	1	1	1	2	1	1	..
	SOUTH CAROLINA																		
59	Medical College of South Carolina, Charleston	1	..	..	3	..	..	..	..	..	4	..	..	..	..	..	..	..	..
	TENNESSEE																		
60	University of Tennessee College of Medicine, Memphis	8	1	9	11	2	1	..	2	..	5	..	2	..	..	2	11	7	..
61	Meharry Medical College, Nashville	1	..	..	2	..	1	..	1	..	2	..	..	1	..	1	..	..	..
62	Vanderbilt University School of Medicine, Nashville	5	..	4	6	..	..	..	..	..	1	..	2	..	..	..	4	4	1
	TEXAS																		
63	Southwestern Medical School of the University of Texas, Dallas	..	..	..	5	..	..	..	..	..	..	..	1	..	..	..	..	2	..
64	University of Texas School of Medicine, Galveston	..	1	..	6	..	..	..	2	..	1	..	2	1	..	..	1	2	..
65	Baylor University College of Medicine, Houston	..	1	..	6	1	1	..	1	..	..	..	1	..	..	..	1	3	..
	UTAH																		
66	University of Utah School of Medicine, Salt Lake City	..	..	..	6	..	..	..	..	..	..	3	1	..	..	..	..	..	..
	VERMONT																		
67	University of Vermont College of Medicine, Burlington	1	..	..	4	..	3	..	1	..	..	..	1	..	..	..	..	..	4
	VIRGINIA																		
68	University of Virginia Department of Medicine, Charlottesville	2	..	1	8	1	3	1	3	..	4	..	1	..	1	1	1	3	1
69	Medical College of Virginia, Richmond	1	..	..	4	..	1	..	4	..	3	..	..	1	..	..	2	1	..
	WASHINGTON																		
70	University of Washington School of Medicine, Seattle	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	WISCONSIN																		
71	University of Wisconsin Medical School, Madison	..	..	..	7	..	..	..	..	..	..	..	3	2	1	2	1	..	..
72	Marquette University School of Medicine, Milwaukee	1	..	..	16	1	1	..	..	..	..	..	5	2	2	1	..	1	..
	CANADA																		
73	University of Alberta Faculty of Medicine, Edmonton	..	..	..	2	..	..	..	..	..	..	1	..	..	..	..	1	..	..
74	University of Manitoba Faculty of Medicine, Winnipeg	..	..	..	1	..	..	..	1	..	..	..	..	..	1	..	..	1	..
75	Dalhousie University Faculty of Medicine, Halifax	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
76	Queen's University Faculty of Medicine, Kingston	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	University of Ottawa Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78	University of Western Ontario Faculty of Medicine, London	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
79	University of Toronto Faculty of Medicine	..	1	..	5	..	1	..	..	..	..	..	..	..	..	..	..	..	..
80	McGill University Faculty of Medicine, Montreal	..	..	1	9	..	3	..	2	..	..	1	1	1	2	..	..	..	..
81	University of Montreal Faculty of Medicine	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
82	Laval University Faculty of Medicine, Quebec	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	OTHERS																		
83	Foreign Medical Faculties	1	..	..	1	..	6	1	8	..	1	..	..	1	1	..	1	..	2
84	Extinct Medical Schools	..	3	..	20	..	2	1	..	..	1	1	2	1	1	3	2	1	..
85	Unapproved Medical Schools	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1
86	Schools of Osteopathy	..	..	..	..	..	..	1	1	..	..	..	..	9	..	..	..	..	..
87	TOTALS	59	60	46	844	84	195	15	139	0	80	35	203	125	85	93	82	85	30
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Increases in the physician population arranged in nine geographic divisions in the United States are shown in table 13. The East North Central and Middle Atlantic group of states had the greatest number of first licentiates, 1,285 and 1,244 respectively. More than 600 were added in four other groups—West North Central, 698; South Atlantic, 887; West South Central, 663; and the Pacific states, 633. The New England states added 320, the East South Central states, 420, the Mountain states 132, and the territories and outlying possessions, 43.

In the past 17 years (1935-1951) there have been 105,401 physicians added to the medical profession as determined by the number who received licenses for the first time. Figures for each year during this period are presented in table 14. Of the 105,401 additions, 90,526 were licensed after a successful written examination and 14,875 by reciprocity or endorsement of credentials. The total number of licenses issued in the same period was 180,152.

Estimated figures indicate that on Dec. 31, 1951, the total number of physicians in continental United States was 211,680, of whom 150,710 were estimated as in private practice. The figure includes 59,970 licensed physicians engaged in full-time research, teaching, and administration. It also includes physicians who have retired, interns and residents in hospitals, and those in the government services.

Registration of Physicians, 1904-1951

A recapitulation of totals for 1951 and for all years since 1904 is included in table 15. This tabulation includes for each year the number of physicians examined and registered by written examination, the annual percentage of failures, the number registered annually by reciprocity or endorsement of credentials, and the total registered. The total number of physicians registered from 1904 to 1933 remained somewhat constant except in 1918 when 4,231 were licensed, the lowest registration in 48 years. This decrease was due to a sudden withdrawal of physicians from civilian life in World War I. After 1933 there was an upward trend for a time, followed by a decline in the years 1940 to 1943 inclusive. There was a noticeable increase in 1943 as the result of the accelerated medical school curriculum and the efforts made to maintain civilian care during World War II at as high a level as possible while still providing for the needs of the military. In 1943 more physicians were registered than in any previous year.

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Virgin Islands	Totals	Marginal Number
2	4	..	1	..	1	..	..	..	1	11	1	21	..	3	4	..	1	29	2	1	..	3	1	..	..	2	..	2	..	..	..	110	53
3	3	1	3	1	1	2	..	..	1	15	..	11	4	..	12	2	2	18	..	1	..	2	1	..	1	3	1	2	4	..	3	149	54
3	3	3	4	..	1	1	..	1	..	14	1	10	2	1	4	1	3	19	..	..	1	1	4	1	..	1	5	4	..	..	1	118	55
1	4	6	..	3	1	..	..	..	2	15	1	13	8	..	9	1	..	22	..	1	1	2	8	1	..	4	..	2	..	1	..	148	56
..	..	..	..	..	1	..	..	..	..	7	1	4	1	..	2	..	1	9	..	..	..	..	2	..	..	..	1	..	1	..	..	40	57
..	1	2	2	..	1	..	..	..	..	..	..	5	..	..	9	1	1	5	..	..	..	2	5	1	..	2	..	4	5	1	..	65	58
1	2	..	..	..	1	..	..	..	..	4	..	1	6	..	..	..	..	1	1	..	..	..	2	1	..	5	..	..	..	..	..	33	59
2	..	5	..	6	4	..	..	..	..	1	3	3	2	..	4	1	2	2	..	1	..	5	17	2	..	2	1	..	1	..	..	125	60
..	..	2	..	2	1	..	1	..	..	..	..	3	3	..	3	2	..	1	..	3	..	1	2	..	..	..	..	..	2	..	..	35	61
..	1	2	1	1	1	..	..	..	..	..	..	1	1	..	4	1	..	..	..	4	..	1	3	1	..	..	1	2	..	..	..	52	62
..	..	1	1	1	2	..	..	..	..	..	1	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	20	63
1	..	3	4	..	3	..	..	..	..	2	1	..	1	..	2	4	1	2	..	..	..	1	..	..	..	1	..	..	..	..	..	42	64
..	1	..	3	..	2	..	1	..	..	1	1	1	..	..	1	..	..	..	..	..	..	1	2	..	..	..	1	..	..	..	2	32	65
..	..	1	..	..	..	1	..	1	..	..	..	1	..	..	2	..	1	..	..	..	..	..	..	4	..	..	1	1	..	1	..	24	66
4	11	1	..	..	..	..	..	..	..	3	..	8	1	..	6	..	..	3	..	..	..	..	1	..	3	..	..	..	..	..	..	55	67
5	4	..	2	..	2	3	..	..	..	2	..	5	9	..	..	..	..	5	..	3	..	2	6	..	..	1	1	4	1	..	..	86	68
3	3	2	5	..	..	1	..	..	..	4	1	3	8	..	6	..	..	..	..	4	..	1	6	..	..	7	..	8	1	..	1	81	69
..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	70
2	..	5	..	..	1	1	..	..	..	1	..	3	..	1	1	..	1	3	..	..	..	1	1	..	..	2	..	..	6	..	1	46	71
..	1	5	4	..	1	1	..	..	..	1	..	11	..	1	3	..	..	1	2	1	1	..	1	..	..	1	2	1	3	..	..	71	72
..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	8	73
..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	1	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	11	74
..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	4	75
1	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	6	76
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	77
..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	6	78
..	4	1	1	2	..	..	..	..	..	..	..	5	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	23	79
..	3	1	3	..	1	..	..	..	2	1	1	5	1	..	..	..	..	..	..	..	..	1	2	..	..	..	1	1	..	..	1	44	80
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	81
..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	3	82
..	2	..	..	..	3	1	..	..	4	16	1	18	..	..	27	1	..	..	..	..	..	2	1	..	1	1	2	..	1	..	4	108	83
2	..	4	..	2	..	1	..	..	1	..	..	3	1	..	1	..	..	1	..	1	..	..	4	1	..	1	..	1	2	1	..	65	84
..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	..	..	..	..	..	1	..	1	52	85
..	6	..	..	..	..	..	..	..	..	6	..	..	..	..	8	..	..	..	..	..	1	..	15	..	..	..	..	..	..	..	..	47	86
122	264	214	134	53	128	38	33	13	41	275	54	771	113	16	312	53	75	272	28	55	25	79	325	37	13	123	136	73	87	23	50	6,295	87
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

The number registered in 1946 was almost double the number registered in 1945 and was greater than in any previous year. Separation from service of a large number of medical officers and their subsequent licensure by endorsement of credentials indicating their return to private practice in states other than those in which they were licensed accounts in large part for this increase. This increase in part was occasioned by the licensure of recent graduates who had entered military service on completion of the internship and before securing state licensure.

In the years since 1946 the numbers registered have annually decreased, although they far exceed the prewar totals. It may be anticipated that the figures will increase as the result of the increased enrollments in the medical schools of the country.

In 1904, the first year shown, the percentage of failures was 19.3. This was an era of proprietary medical schools. Beginning in 1913 the percentage of failures gradually dropped each year until 1930, when 5.7% failed. Beginning in 1936 the percentage of failures began to rise, reaching another peak of 20.7% in 1940. This was the result of the increase in the number of foreign-trained physicians seeking licensure in the United States, many of whom are not successful after repeated attempts at licensure examinations. Since 1944 the percentage of failures has been dropping owing perhaps to a decrease in the number of foreign-trained physicians examined as contrasted with the prewar years and also the fact that there are fewer graduates of unapproved medical schools seeking licensure. There has been no unapproved medical school in operation since 1948.

This table again refers to examinations given annually rather than persons examined.

Candidates Examined for Medical Licensure, 1947-1951

In table 16 are tabulated the number of candidates examined for medical licensure in the United States and its territories and outlying possessions for the five year period 1947-1951. For each year there is recorded the number who passed and failed licensing examinations. Totals for the five years and the percentage of failures for five years are also given.

In the five year period shown 32,427 examinations were given; 28,734 were successful tests and 3,693, or 11.4%, resulted in failures. New York leads in the number of examinations given. In this state 4,060 were examined of whom 1,984, or 48.8%, failed. More than

2,000 examinations were also given in California and Illinois and more than 1,000 were given in Florida, Minnesota, Missouri, Ohio, Pennsylvania, and Texas.

The greatest percentage of failures, 66.2%, occurred in Massachusetts. The majority of those who failed in this state represent graduates of unapproved medical schools and schools of osteopathy. The number of failures in this state, however, is decreasing since the unapproved schools whose graduates the licensing board was required by law to examine are no longer in operation. The State Approving Authority has furthermore ruled that students matriculating after Jan. 1, 1941, in institutions not meeting the standards of this authority will not be eligible for licensure.

TABLE 12.—*Licentiates Representing Additions to the Medical Profession, 1951*

	Examination	Reciprocity and Endorsement	Total
Alabama	67	6	73
Arizona	9	1	10
Arkansas	79	0	79
California	450	76	526
Colorado	76	7	83
Connecticut	30	63	93
Delaware	6	0	6
District of Columbia	27	55	82
Florida	94	0	94
Georgia	118	5	123
Idaho	7	0	7
Illinois	389	48	437
Indiana	113	7	120
Iowa	75	8	83
Kansas	92	7	99
Kentucky	101	2	103
Louisiana	213	0	213
Maine	11	3	14
Maryland	167	16	183
Massachusetts	19	151	170
Michigan	193	30	223
Minnesota	131	24	155
Mississippi	76	4	80
Missouri	224	12	236
Montana	3	0	3
Nebraska	95	6	101
Nevada	0	0	0
New Hampshire	3	16	19
New Jersey	50	63	113
New Mexico	0	0	0
New York	264	479	743
North Carolina	123	13	136
North Dakota	16	1	17
Ohio	346	48	394
Oklahoma	74	0	74
Oregon	39	9	48
Pennsylvania	274	114	388
Rhode Island	12	8	20
South Carolina	62	2	64
South Dakota	6	1	7
Tennessee	162	2	164
Texas	291	6	297
Utah	24	1	25
Vermont	2	2	4
Virginia	165	15	180
Washington	47	12	59
West Virginia	16	3	19
Wisconsin	111	0	111
Wyoming	4	0	4
Alaska, Canal Zone, Hawaii, Guam, Puerto Rico, Virgin Islands	29	14	43
Totals	4,985	1,340	6,325

New York had a percentage failure in the five year period of 48.8 and California's percentage of failures was 29.9. These states examine a considerable number of graduates of foreign medical schools, many of whom do not pass their first examination. Regulations permitting certain graduates of unapproved and osteopathic schools to the licensure examination in New York also contributed to its high percentage of failures.

In summary, 3 states had more than 29% failures in five years; 5 states had more than 10%, 10 states more than 5%, and 26 states less than 5%. Six states, Kentucky, Missouri, Tennessee, Washington, West Virginia, and Wyoming, had no failures in five years

The annual percentage of failures for all boards has varied from 10.5% to 12.5%. The highest percentage was in 1949.

TABLE 13.—*Licentiates Representing Additions to the Medical Profession Grouped in Geographic Divisions, 1951*

	Examination	Reciprocity and Endorsement	Total
New England			
Maine	11	3	14
New Hampshire	3	16	19
Vermont	2	2	4
Massachusetts	19	151	170
Rhode Island	12	8	20
Connecticut	30	63	93
	77	243	320
Middle Atlantic			
New York	264	479	743
New Jersey	50	63	113
Pennsylvania	274	114	388
	588	656	1,244
East North Central			
Ohio	346	48	394
Indiana	113	7	120
Illinois	389	48	437
Michigan	193	30	223
Wisconsin	111	0	111
	1,152	133	1,285
West North Central			
Minnesota	131	24	155
Iowa	75	8	83
Missouri	224	12	236
North Dakota	16	1	17
South Dakota	6	1	7
Nebraska	95	6	101
Kansas	92	7	99
	639	59	698
South Atlantic			
Delaware	6	0	6
Maryland	167	16	183
District of Columbia	27	55	82
Virginia	165	15	180
West Virginia	16	3	19
North Carolina	123	13	136
South Carolina	62	2	64
Georgia	118	5	123
Florida	94	0	94
	778	109	887
East South Central			
Kentucky	101	2	103
Tennessee	162	2	164
Alabama	67	6	73
Mississippi	76	4	80
	406	14	420
West South Central			
Arkansas	79	0	79
Louisiana	213	0	213
Oklahoma	74	0	74
Texas	291	6	297
	657	6	663
Mountain			
Montana	3	0	3
Idaho	7	0	7
Wyoming	4	0	4
Colorado	76	7	83
New Mexico	0	0	0
Arizona	9	1	10
Utah	24	1	25
Nevada	0	0	0
	123	9	132
Pacific			
Washington	47	12	59
Oregon	39	9	48
California	450	76	526
	536	97	633
Territories and Possessions			
Alaska, Canal Zone, Guam, Hawaii, Puerto Rico, and Virgin Islands	29	14	43
Totals	4,985	1,340	6,325

The foregoing figures represent examinations given and not persons examined. A candidate who fails more than once in a state in a given year is counted as one failure, but, should he again fail in a succeeding year,

this fact is computed among the failures for that year. In compiling the tabulations in this study, a successful candidate securing a license in more than one state in a given year is counted in both states and also counted if he passed at examinations in later years. The totals in this table give only a fair approximation of the numbers of physicians added to the profession after written examination during the last five years. Table 12 gives the exact compilation of the number of physicians who constitute new additions to the medical profession.

Graduates of Approved Schools and Others Registered, 1922-1951

In table 17, the numbers of physicians registered are grouped in two categories, namely, graduates of approved medical schools and others. In the computation of these figures, schools rated as Class A and B by the Council on Medical Education and Hospitals of the American Medical Association since 1907 are classified as approved. In the column headed "Others" are included persons who graduated prior to 1907 when the first classification of medical schools was made by the Council, graduates of foreign faculties of medicine, Class C graduates, osteopaths given recognition by medical licensing boards, and graduates of schools not approved by the Council. In 1928 the classification of medical schools in categories of A, B, and C by the Council was discontinued, and a list of approved medical schools has since been maintained. Medical schools not meeting the standards of the Council since 1928 have been considered as unapproved institutions.

TABLE 14.—*Licentiates Representing Additions to the Medical Profession, 1935-1951*

	Examination	Reciprocity and Endorsement	Total
1935	5,099	411	5,510
1936	5,548	629	6,177
1937	5,812	612	6,424
1938	5,759	501	6,260
1939	5,584	460	6,044
1940	5,432	455	5,887
1941	5,241	474	5,715
1942	5,560	454	6,014
1943	5,586	372	5,958
1944	6,495	470	6,965
1945	4,979	769	5,748
1946	5,362	1,608	6,970
1947	5,273	1,617	6,890
1948	4,942	1,694	6,636
1949	4,260	1,616	5,876
1950	4,609	1,393	6,002
1951	4,985	1,340	6,325
Totals	90,526	14,875	105,401

In 1951 there were 12,011 candidates registered, of whom 11,097 (92.3%) represented graduates of approved schools and 914 (7.7%) were in the second group. In the 30 years recorded in this table, 273,025 were registered, including 245,795 approved graduates, 90%, and 27,230 others, 10%.

Graduates of Unapproved Medical Schools Registered, 1947-1951

Graduates of institutions which were classified by the Council on Medical Education and Hospitals of the American Medical Association as unapproved were registered in 25 states, the District of Columbia, and the territories and outlying possessions in the past five years. Figures are reported separately in table 18 for those licensed after written examination and those licensed by reciprocity or endorsement of credentials. The table also includes a column combining the figures for these two groups. In the main they represent five schools more recently in operation, all but one of which is now closed. The latter institution has obtained the status of an approved institution. At the present time there is no medical school in operation which is not approved by the Council.

There were 750 graduates of unapproved medical schools registered in the five year period (1947-1951), 675 by examination and 75 by endorsement of credentials. In 1951 there were 75 licensed in 12 states and the territories, 23 by examination and 52 by reciprocity.

TABLE 15.—*Registration of Physicians, 1904-1951*

Year	Examined	Passed	Percentage Failed	Reciprocity and Endorsement	Total Registered
1904	7,056	5,693	19.3	1,005	6,698
1905	7,178	5,688	20.8	394	6,082
1906	8,040	6,373	20.7	1,502	7,875
1907	7,279	5,731	21.3	1,427	7,158
1908	7,775	6,089	21.7	1,284	7,373
1909	7,295	5,865	19.6	1,381	7,246
1910	7,011	5,719	18.4	1,640	7,359
1911	6,964	5,582	19.8	1,243	6,825
1912	6,880	5,467	20.5	1,273	6,740
1913	6,453	5,253	18.6	1,292	6,545
1914	5,579	4,379	21.5	1,439	5,818
1915	5,334	4,507	15.5	1,399	5,906
1916	4,878	4,151	14.9	1,353	5,504
1917	4,754	4,085	14.0	1,360	5,445
1918	3,667	3,184	13.2	1,047	4,231
1919	4,750	4,074	14.2	2,546	6,620
1920	4,796	4,062	15.3	2,558	6,620
1921	4,825	4,228	12.4	2,186	6,414
1922	4,031	3,539	12.2	2,073	5,612
1923	4,727	4,028	14.8	2,405	6,433
1924	5,392	4,756	11.8	1,923	6,679
1925	6,002	5,450	9.2	1,861	7,311
1926	5,770	5,314	7.9	1,955	7,269
1927	5,389	5,002	7.2	2,176	7,178
1928	5,458	5,090	6.7	2,228	7,318
1929	5,629	5,282	6.2	2,420	7,702
1930	5,571	5,255	5.7	2,366	7,621
1931	5,611	5,263	6.2	2,211	7,476
1932	5,675	5,247	7.6	1,886	7,133
1933	5,673	5,244	7.6	1,989	7,233
1934	6,145	5,628	8.4	2,161	7,789
1935	6,443	5,859	9.1	2,194	8,053
1936	6,918	6,224	10.0	2,773	8,997
1937	7,334	6,604	10.0	3,205	9,809
1938	7,461	6,589	11.7	2,956	9,545
1939	7,754	6,493	16.3	2,872	9,365
1940	7,926	6,291	20.7	2,866	9,157
1941	7,539	6,057	19.7	2,762	8,819
1942	7,223	6,120	15.4	2,469	8,589
1943	8,403	7,489	10.9	2,340	9,829
1944	6,817	6,011	11.8	2,596	8,607
1945	5,930	5,343	9.9	3,622	8,965
1946	7,610	6,856	9.9	9,669	16,525
1947	7,164	6,414	10.5	7,701	14,115
1948	6,624	5,904	10.8	7,595	13,499
1949	5,963	5,219	12.5	6,929	12,148
1950	6,203	5,481	11.6	6,755	12,236
1951	6,473	5,716	11.7	6,295	12,011

Illinois, which accepted for licensure the graduates of one school not approved by the Council until late in 1948, Florida, New York, and Texas, which have made certain concessions, and Massachusetts licensed the largest number of graduates of unapproved medical schools. In the latter state, the institutions referred to in the table were not granted approval by the State Approving Authority. Matriculants after Jan. 1, 1941, are not eligible for licensure. The number being licensed in all of these states was greatly decreased in 1950 and 1951.

Graduates of Schools of Osteopathy Registered by Medical Examining Boards, 1947-1951

The number of graduates of schools of osteopathy granted the privilege of practicing medicine or surgery or both by 18 medical examining boards for five years (1947-1951) is given in table 19. There have been 935 such persons registered, 663 by examination and 272

without written examination. In 1951 there were 202 so registered in 12 states, 155 by examination and 47 by reciprocity.

The situation which obtains in these states providing for the licensure of osteopaths by the medical examining board is as follows. In 1947, Alabama registered a graduate of a school of mechanotherapy. In Colorado, an osteopath receives a license to practice medicine. In Connecticut any registered osteopath may obtain the right to practice medicine or surgery or both according to the type of examination taken. Osteopaths in Delaware may be licensed as osteopathic physicians. The District of Columbia grants osteopaths the privilege of practicing surgery. Under an amendment to the medical practice act in 1945, osteopaths in Indiana are permitted to practice medicine and surgery. Licentiates in osteopathy prior to 1945 are authorized to practice osteopathy, surgery, and obstetrics. In Massachusetts the medical practice act by definition includes osteopathy in the practice of medicine and does not differentiate the type of license issued to an osteopathic physician. A law passed in Nebraska in 1943 provided that osteopaths might make application for a license to practice medicine and surgery by examination if application was made prior to July 1, 1948. In New Hampshire osteopaths are granted the right to practice medicine and surgery.

New Jersey provides that osteopaths licensed prior to Nov. 1, 1941, who have served for a period of two years as an intern or resident surgeon in an approved osteopathic or medical hospital, or completed a postgraduate course of two years in a college of osteopathy or medicine approved by the board, or have had at least three years of practice in a hospital approved by the board, can be admitted to an examination in pharmacology, therapeutics, and surgery and if successful can obtain a license to practice medicine and surgery.

In New York a law approved April 10, 1946, provides that any osteopathic licentiate who had obtained the additional right to use instruments for minor surgical procedures and to use anesthetics, antiseptics, narcotics, and biologic products, or any applicant who has met or shall meet all the preliminary and professional requirements as of Sept. 1, 1936, and has satisfactorily passed or shall so pass the regular licensing examination shall be granted the right to practice medicine without limitation.

Osteopaths in Ohio who obtained their licenses under an act passed in 1943 are given the right to practice osteopathic medicine and surgery. In Oregon osteopaths are granted the right to practice in the subjects covered by the examination. In South Dakota, osteopaths may be issued a license to practice osteopathic medicine, surgery, and obstetrics which is an unrestricted license. Texas issues but one license, unrestricted in scope. In Virginia osteopaths may obtain the right to use drugs and perform surgery with the use of instruments. The Wisconsin law as amended in 1950 provides that an osteopath licensed in Wisconsin may obtain a license to practice medicine and surgery by completing a refresher course in materia medica and pharmacology consisting of not less than 64

TABLE 16.—*Candidates Examined, 1947-1951*

	1947		1948		1949		1950		1951		Totals for Five Years		
	P	F	P	F	P	F	P	F	P	F	P	F	% F
Alabama	97	0	16	2	46	1	39	0	60	2	258	5	1.9
Arizona	19	3	17	0	22	0	8	1	14	0	80	4	4.8
Arkansas	54	0	59	0	52	0	74	0	83	4	322	4	1.2
California	503	10	493	36	492	57	543	37	500	54	2,531	194	7.1
Colorado	95	0	72	2	78	0	76	0	84	1	405	3	0.7
Connecticut	49	17	32	7	29	15	29	19	34	16	173	74	29.9
Delaware	20	0	20	0	21	0	23	0	13	1	97	1	1.0
Dist. of Columbia	39	0	33	3	30	1	24	3	27	2	153	9	5.6
Florida	314	17	501	26	308	19	325	46	374	53	1,622	161	9.0
Georgia	129	0	131	1	109	4	147	1	147	0	663	6	0.8
Idaho	62	0	51	0	38	1	1	0	8	0	160	1	0.6
Illinois	605	16	512	44	367	67	399	60	419	91	2,302	278	10.7
Indiana	111	12	99	2	98	4	112	3	116	3	536	24	4.2
Iowa	55	0	67	0	57	0	86	1	81	0	346	1	0.2
Kansas	86	0	67	0	99	1	96	1	92	0	440	2	0.4
Kentucky	90	0	60	0	86	0	88	0	104	0	428	0	0.0
Louisiana	225	1	182	0	164	1	190	1	217	0	978	3	0.3
Maine	31	2	31	3	25	4	19	1	15	6	121	16	11.7
Maryland	175	6	185	8	172	17	183	10	174	14	889	55	5.8
Massachusetts	84	140	65	111	41	92	26	71	35	79	251	493	66.2
Michigan	116	0	181	0	164	0	195	0	221	1	877	1	0.1
Minnesota	248	0	212	1	184	0	201	0	166	0	1,011	1	0.1
Mississippi	59	0	47	0	35	5	64	1	77	0	282	6	2.0
Missouri	265	0	238	0	198	0	206	0	230	0	1,137	0	0.0
Montana	8	0	10	1	8	0	5	0	3	0	34	1	2.9
Nebraska	87	3	84	16	52	4	96	3	96	6	415	32	7.1
Nevada	8	0	3	1	4	1	0	0	0	0	15	2	11.8
New Hampshire	10	0	10	1	7	1	6	1	6	3	39	6	13.3
New Jersey	89	13	90	22	76	9	41	11	54	11	350	66	15.8
New Mexico	1	0	3	0	4	1	2	0	2	0	12	1	7.7
New York	610	482	426	371	411	397	290	397	339	337	2,076	1,984	48.8
North Carolina	113	1	112	0	88	0	97	1	125	1	535	3	0.5
North Dakota	25	0	30	0	24	0	35	3	26	8	140	11	7.3
Ohio	297	3	322	7	262	6	326	19	371	46	1,578	81	4.9
Oklahoma	72	0	59	0	47	1	82	0	66	0	326	1	0.3
Oregon	80	0	48	0	47	4	38	2	42	0	255	6	2.2
Pennsylvania	437	3	448	6	396	3	326	2	277	1	1,884	15	0.7
Rhode Island	32	0	21	0	15	1	12	3	12	0	92	4	4.2
South Carolina	55	0	57	0	43	1	59	0	63	0	277	1	0.3
South Dakota	18	0	27	0	10	0	20	0	23	3	98	3	3.0
Tennessee	148	0	150	0	177	0	142	0	155	0	772	0	0.0
Texas	282	13	262	33	184	10	277	16	305	8	1,310	80	5.7
Utah	0	0	18	0	30	0	29	0	24	1	101	1	1.0
Vermont	27	1	16	0	11	4	15	1	4	0	73	6	7.6
Virginia	130	4	136	4	109	5	138	1	168	2	681	16	2.3
Washington	116	0	110	0	72	0	60	0	54	0	412	0	0.0
West Virginia	40	0	55	0	61	0	42	0	26	0	224	0	0.0
Wisconsin	143	0	182	7	109	0	130	0	132	0	696	7	1.0
Wyoming	0	0	0	0	1	0	2	0	4	0	7	0	0.0
U. S. Territories and Possessions	55	3	54	5	56	7	57	6	48	3	270	24	6.1
Total Examined	7,164		6,624		5,963		6,203		6,473		32,427		
Passed	6,414		5,904		5,219		5,481		5,716		28,734		
Failed	750		720		744		722		757		3,693		
Percentage Failed	10.5		10.8		12.5		11.6		11.7		11.4		

TABLE 17.—*Graduates of Approved Schools and Others Registered, 1922-1951*

Year	Graduates of Approved Schools: Number	Graduates of Approved Schools: Per Cent of Total	Others: Number	Others: Per Cent of Total	Totals
1922	4,519	80.5	1,093	19.5	5,612
1923	5,196	80.8	1,237	19.2	6,433
1924	5,687	85.1	992	14.9	6,679
1925	6,314	86.4	997	13.6	7,311
1926	6,441	88.7	828	11.3	7,269
1927	6,410	89.4	768	10.6	7,178
1928	6,585	90.1	733	9.9	7,318
1929	7,003	91.0	699	9.0	7,702
1930	7,011	92.1	610	7.9	7,621
1931	6,932	92.8	544	7.2	7,476
1932	6,676	92.1	457	6.3	7,133
1933	6,774	93.7	459	6.3	7,233
1934	7,172	92.1	617	7.9	7,789
1935	7,360	91.3	693	8.5	8,053
1936	7,934	88.1	1,063	11.8	8,997
1937	8,391	85.5	1,418	14.4	9,809
1938	8,315	87.1	1,230	12.9	9,545
1939	8,067	86.2	1,298	13.8	9,365
1940	7,781	85.0	1,376	15.0	9,157
1941	7,770	87.9	1,049	11.9	8,819
1942	7,290	84.9	1,299	15.1	8,589
1943	8,640	87.9	1,189	12.2	9,829
1944	7,737	89.8	870	10.1	8,607
1945	8,233	91.8	732	8.1	8,965
1946	15,692	94.9	835	5.1	16,527
1947	13,097	93.0	1,018	7.0	14,115
1948	12,791	94.8	708	5.2	13,499
1949	11,378	93.7	770	6.3	12,148
1950	11,502	94.0	734	6.0	12,236
1951	11,097	92.3	914	7.7	12,011
Totals	245,795	90.0	27,230	10.0	273,025

hours of lecture and 60 hours of laboratory work and by passing an examination in these subjects. Osteopaths not licensed in the state may apply to take the same examination as physicians and if successful will be granted licenses to practice medicine and surgery. In Wyoming the statutes contain no specific provision for the licensing of osteopaths. The medical practice act provides that the certificates issued to all applicants shall be deemed licenses to practice medicine in all branches in which the applicant has taken an examination.

TABLE 18.—*Graduates of Unapproved Medical Schools Registered, 1947-1951*

	Examination						Reciprocity or Endorsement						Combined Totals
	1947	1948	1949	1950	1951	Totals	1947	1948	1949	1950	1951	Totals	
Arizona	..	..	..	..	..	..	..	1	1	..	2	4	4
Arkansas	..	..	..	1	..	1	..	..	..	..	..	..	1
California	..	..	..	2	..	2	..	..	..	5	..	5	7
District of Columbia	..	..	..	..	..	..	..	..	..	1	..	1	1
Florida	11	25	25	16	9	86	..	..	..	..	..	..	86
Georgia	..	..	1	1	1	3	..	..	3	..	1	4	7
Illinois	54	56	41	5	2	158	..	1	..	..	..	1	159
Kentucky	2	..	2	..	..	4	..	..	..	..	..	..	4
Maine	..	..	..	..	..	..	..	..	2	1	1	4	4
Massachusetts	37	26	11	5	4	83	..	..	..	..	..	..	83
Michigan	..	..	..	..	..	..	..	..	..	1	1	2	2
Mississippi	..	3	..	1	1	5	..	..	..	..	..	..	5
Missouri	..	..	..	..	..	..	..	..	..	3	..	3	3
Nebraska	..	..	..	..	..	..	..	1	..	..	..	1	1
New Hampshire	1	..	..	..	..	1	..	..	..	..	..	..	1
New Mexico	1	..	..	..	..	1	..	..	..	..	..	..	1
New York	132	60	94	7	4	297	..	..	..	..	..	..	297
North Carolina	..	..	..	3	..	3	..	..	..	..	..	..	3
Ohio	4	1	1	1	..	7	..	..	..	..	..	..	7
Pennsylvania	..	..	..	1	1	2	..	..	..	..	..	..	2
Tennessee	..	..	..	..	..	..	..	..	1	..	..	1	1
Texas	..	..	..	..	..	..	..	..	..	2	45	47	47
Virginia	4	1	3	..	..	8	..	..	..	..	..	..	8
Washington	4	1	1	..	..	6	..	..	..	..	..	..	6
West Virginia	..	..	2	..	..	2	..	..	..	..	..	..	2
Wisconsin	..	..	..	..	..	..	..	..	..	..	1	1	1
U. S. Territories and Possessions	..	..	3	2	1	6	..	..	..	..	1	1	7
Totals	250	173	184	45	23	675	0	3	7	13	52	75	750

TABLE 19.—*Graduates of Schools of Osteopathy Registered by Medical Boards, 1947-1951*

	Examination						Reciprocity or Endorsement						Combined Totals
	1947	1948	1949	1950	1951	Totals	1947	1948	1949	1950	1951	Totals	
Alabama	1	..	..	..	..	1	..	..	..	..	..	..	1
Colorado	11	5	5	8	10	39	..	..	..	..	..	..	39
Connecticut	3	..	1	4	1	9	..	..	..	..	..	..	9
Delaware	..	..	..	..	1	1	..	..	1	..	1	2	3
District of Columbia	..	..	..	1	..	1	1	2	1	1	1	6	7
Indiana	..	..	3	3	..	6	..	..	1	..	9	10	16
Massachusetts	2	2	..	..	2	6	1	5	3	3	6	18	24
Nebraska	1	..	1	..	..	2	..	..	..	..	..	..	2
New Hampshire	..	..	..	..	..	..	3	6	4	1	..	14	14
New Jersey	9	3	5	7	2	26	2	3	1	2	6	14	40
New York	134	34	11	34	45	258	75	13	2	3	..	93	351
Ohio	12	21	24	28	46	131	10	12	4	8	8	42	173
Oregon	..	1	..	..	..	1	16	8	5	..	..	29	30
South Dakota	..	..	..	1	..	1	..	..	..	1	1	2	3
Texas	38	33	15	35	37	158	..	1	9	5	15	30	188
Virginia	..	1	..	1	..	2	..	1	..	..	..	1	3
Wisconsin	3	2	1	4	11	21	3	6	1	..	..	10	31
Wyoming	..	..	..	..	..	..	..	..	..	1	..	1	1
Totals	214	102	66	126	155	663	111	57	32	25	47	272	935

Preprofessional Requirements of Licensing Boards

Since 1918 the minimum requirement of the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges has been two years of college training. In 1938 both these agencies recommended that at least three years of college work be required of all candidates for admission. In December, 1951, the Council revised its "Essentials of an Acceptable Medical School." The present requirements are as follows:

1. Collegiate training in preparation for the study of medicine should provide the opportunity for a good general education, including the attainment of competence in English. It should include theoretical and laboratory courses in physics, biology, and inorganic and organic chemistry. At the present time the minimum requirement for admission to approved medical schools is three years of college training for the average student.[2] For most students, four years is recommended in order to provide an opportunity to gain a broad educational experience. Rarely, a school will be justified in admitting a superior student under exceptional conditions after two years of college work.

2. Since it cannot in general be assumed that all who have satisfied these requirements merely in terms of hourly credits are fitted for the study of medicine, it is desirable that qualitative standards with reference to academic performance, character, motivation, and health also be imposed.

3. As a rule candidates should have received their preliminary education in institutions approved by accrediting agencies acceptable to the Council. Exception to this rule may be made in the case of applicants who

2. This requirement of three years becomes effective for students entering medical school after Jan. 1, 1953.

have demonstrated superior ability. For the convenience of admitting officers the Council has compiled a list of colleges of arts and sciences approved by regional educational associations.

4. Candidates who have completed three years of collegiate instruction and present evidence of having accomplished work of distinction in one or more fields of learning, but who lack credit in any or all of the required subjects, may be admitted on passing examination in these subjects.[3]

All state licensing boards (table 20) require that an applicant for licensure must present evidence of having completed two years of college. Until 1951, California exacted only a high school education. It initiated a two year requirement in 1951 for present graduates and three years for graduates after Jan. 1, 1955. Six states and Puerto Rico specify a three year college requirement.

Seventy-seven of the 79 medical and basic science schools in the United States require three or more years of premedical study. Five of the Canadian schools have a similar requirement. Nine schools require a bachelor's degree. One of the nine schools requires only three years of college work from veterans, while two of these schools will accept students with three years of college work provided their colleges will grant them a bachelor's degree on the successful completion of the first year of medical school.

TABLE 20.—*Requirements of Preprofessional Training by Medical Licensing Boards*

Two Years or More of College		
Alabama	Massachusetts	South Carolina [1]
Arizona	Michigan [1]	South Dakota
Arkansas	Minnesota	Tennessee [1]
California	Mississippi	Texas
Colorado	Missouri	Utah
Connecticut	Montana	Vermont
Delaware	Nebraska	Virginia
District of Columbia	Nevada	Washington
Florida [1]	New Hampshire	West Virginia
Georgia	New Jersey	Wisconsin [1]
Idaho	New Mexico	Wyoming
Illinois	New York	Alaska
Indiana	North Carolina [1]	Canal Zone
Iowa [1]	North Dakota	Guam
Kansas	Ohio	Hawaii
Kentucky	Oklahoma	Puerto Rico [1]
Louisiana	Oregon	Virgin Islands
Maine	Pennsylvania	
Maryland	Rhode Island	

1. Three year college requirement.

Professional Educational Requirements of Licensing Boards

The medical practice acts or board regulations of several state medical licensing boards specify the length of the medical school course. In other states the law or ruling reads that the professional educational requirement accepted for approval by the Council on Medical Education and Hospitals of the American Medical Association or for membership in the Association of American Medical Colleges, or both, is the regulation for licensure. Table 21 outlines the requirement of each state in this respect. This table does not record the internship, which is a requirement for licensure by 31 boards.

3. Certain state boards of medical licensure, however, require completion of regular college courses in all required subjects.

Approval of Medical Schools

Nine states maintain their own list of approved medical schools in the United States and Canada. Six of these states accept the list of medical schools approved by the Council on Medical Education and Hospitals of the American Medical Association and/or the Association of American Medical Colleges. Nineteen boards require applicants for licensure from medical schools in the United States or Canada to be graduates of medical schools approved by the Council. Two boards require membership in the Association of American Medical Colleges. Twenty-nine boards require that schools be approved by the Council and in membership in the Association of American Medical Colleges. In the majority of instances this requirement is specified in the medical practice act or is a formal regulation of the board. In only five instances is it an informal policy.

Required Internships

Only six schools in the United States and four in Canada require that their students complete an internship. These schools are listed in table 22. However, for many years more than 99% of all graduates have voluntarily served an internship, and a majority have had additional hospital training before entering practice.

One year of internship, as a prerequisite to licensure, is required by the licensing boards of 25 states, the District of Columbia, Alaska, Guam, Hawaii, Puerto Rico, and the Virgin Islands. The internship requirement was instituted during the past year by California and Kentucky. It is no longer a requirement in Kansas. Ten boards specify that the internship must be a rotating service. North Dakota, Vermont, Wisconsin and Hawaii, which formerly required a rotating service, now indicate that either a rotating or a straight service is acceptable. Michigan, which requires a rotating service, will accept a 24 month mixed or straight internship in lieu of a rotating service. New Jersey specifies that a two year residency in a specialty or one year of postgraduate work will meet the requirement of a rotating internship service. Alaska will accept active practice for four years in lieu of the internship requirement. Those licensing boards which require an internship for licensure are listed in table 23.

Licensure Requirements for Interns and Residents in Hospitals

Two states and Puerto Rico report that physicians serving internships must be licensed in the state in which the hospital where they are interning is located. Georgia, Indiana, and Puerto Rico have this requirement. New Jersey permits a service of two years and Florida a three year service before licensure, while Minnesota reports that licensure is not required if the internship is being served for the M.D. degree at the University of Minnesota. California, Colorado, Delaware, and Massachusetts require an intern to register with the licensing board, while in West Virginia the requirement applies only to graduates of foreign medical schools.

Twenty-one states and Puerto Rico require that physicians serving as residents in hospitals must be licensed in the state. In Connecticut and Maryland it is not a requirement of the licensing board but is customarily

required by hospitals in those states. Fourteen states and the District of Columbia, while not requiring licensure, specify that licensure is recommended, may grant temporary certificates during the period of residency or for a stipulated time, require residents to register with the board, or will permit service for a definite period without licensure.

The regulations of each of the licensing boards that exact some requirement of those engaged in intern or residency training are given in table 24.

examination and meeting dates of the boards of examiners in the basic sciences. In some states temporary permits are granted enabling physicians to begin the practice of medicine immediately. The next section of this report gives data pertaining to the issuance of temporary permits.

Temporary Permits

The licensing boards of 23 states, Alaska, Puerto Rico, and the Virgin Islands provide for the issuance of temporary permits. These states, the length of validity of the

TABLE 21.—*Professional Educational Requirements by Medical Licensing Boards*

	Length of Medical School Academic Year						Total Time Spent in Medical School (Registration to Graduation)						
	Hours	Weeks	Months	Same as Approved Medical Schools	Same as A.A.M.C. and C.M.E. and H.*	Not Specified by Board	Hours	Weeks	Months Annual	Years	M.D. Degree	Same as Approved Medical Schools	Same as A.A.M.C. and C.M.E. and H.*
Alabama	..	..	..	..	..	X	..	..	..	4	..	..	..
Arizona	..	..	..	..	X	..	..	..	..	4	..	..	..
Arkansas	..	..	9	..	..	..	..	..	36	..	..	..	..
California	..	..	..	..	..	X	..	..	..	4	..	..	..
Colorado	..	..	..	..	..	X	..	..	..	..	X	..	..
Connecticut	..	32	..	..	..	..	..	32	..	4	..	..	..
Delaware	..	..	7	..	..	X	..	..	28	..	X	..	..
District of Columbia	..	..	9	..	..	..	..	..	36	..	..	..	..
Florida	..	..	..	..	X	..	..	..	..	..	..	..	X
Georgia	..	..	9	..	..	..	..	..	..	4	..	..	..
Idaho	..	..	9	..	..	..	..	..	..	4	..	..	..
Illinois	..	..	9	..	..	..	..	..	40	..	..	..	..
Indiana	..	..	8	..	..	..	..	..	..	4	..	..	..
Iowa	..	..	9	..	..	..	..	..	..	4	..	..	..
Kansas	..	..	9	..	..	..	..	..	..	4	..	..	..
Kentucky	..	..	9	..	..	..	..	..	..	4	..	..	..
Louisiana	..	..	..	..	X	..	..	..	..	..	X	..	X
Maine	..	..	8	..	..	..	..	..	..	4	..	..	..
Maryland	..	..	..	..	X	..	..	..	..	..	..	..	X
Massachusetts	..	32	..	..	..	..	..	..	..	4	..	..	..
Michigan	..	..	9	..	..	..	..	..	36	4	..	..	..
Minnesota	..	36	..	..	..	..	..	..	..	4	..	..	..
Mississippi	..	32	..	..	..	..	..	..	..	4	..	..	..
Missouri	..	32	..	..	..	..	..	..	..	4	..	..	..
Montana	..	..	9	..	..	..	..	..	..	4	..	..	..
Nebraska	..	..	9	..	..	..	..	..	..	4	..	..	..
Nevada	..	..	9	..	..	..	..	..	..	4	..	..	..
New Hampshire	..	..	..	..	..	X	..	..	..	..	X	..	..
New Jersey	..	..	8	..	..	..	..	..	..	4	..	..	..
New Mexico	..	..	..	X	..	..	..	..	..	..	X	X	..
New York	..	..	8	..	..	..	..	..	..	4	..	..	..
North Carolina	..	..	..	..	..	X	..	..	..	4	..	..	..
North Dakota	..	..	9	..	..	..	..	..	..	4	..	..	..
Ohio	..	..	8½	..	..	..	..	..	..	4	..	..	..
Oklahoma	..	..	..	..	..	X	..	..	..	..	..	X	..
Oregon	..	..	8	..	..	..	..	..	32	4	..	..	..
Pennsylvania	..	32	..	..	..	..	1,120	..	..	4	..	..	..
Rhode Island	..	..	..	..	..	X	..	..	..	..	X	..	..
South Carolina	..	..	..	..	X	..	..	..	..	4	..	..	..
South Dakota	..	..	..	..	..	X	..	..	..	4	..	..	..
Tennessee	.	..	9	..	..	..	..	..	36	..	..	..	..
Texas	..	..	8	..	..	..	..	..	..	4	..	..	..
Utah	..	..	9	..	..	..	..	..	..	4	..	..	..
Vermont	900	..	..	..	..	..	..	..	..	4	..	..	..
Virginia	..	..	8	..	..	..	..	..	..	4	..	..	..
Washington	..	..	..	..	X	..	..	..	..	4	..	..	X
West Virginia	..	..	..	..	..	X	..	..	..	..	X	..	X
Wisconsin	..	..	..	..	X	..	..	..	..	4	..	..	X
Wyoming	..	..	..	..	X	..	..	..	..	..	..	..	X
Alaska	..	..	..	..	X	..	..	..	..	..	..	..	X
Canal Zone	..	..	10	..	..	..	..	..	..	4	X	..	..
Guam	..	..	..	..	..	X	..	..	..	..	..	X	..
Hawaii	..	..	..	..	..	X	..	..	..	..	..	..	X
Puerto Rico	..	..	..	..	X	..	..	..	..	..	..	..	X
Virgin Islands	..	..	..	..	..	X	..	..	..	..	X	..	X

* Association of American Medical Colleges and Council on Medical Education and Hospitals of the American Medical Association.
X Implies requirements are those of the accrediting agencies.

Schedule of Written Examination Dates and Reciprocity Meetings

The schedule of state licensing boards for written examinations for medical licensure and meetings or oral examinations for the issuance of licenses by reciprocity and/or endorsement of credentials is given in table 25. To meet the demands for licensure in recent years as a result of the increase in the number of candidates seeking licensure, examination dates and reciprocity meetings have been scheduled at more frequent intervals. In those states requiring a basic science certificate for licensure, these dates are arranged to coincide closely with the

permit, and the number of permits granted during the last calendar year are shown in table 26. Four states were added to this group in 1951. Illinois, which formerly required licensure, will now issue a temporary certificate for postgraduate and specialty training and will also issue a limited license for practice in state hospitals. Nevada prior to 1951 required interns and residents to be licensed but now will issue a temporary permit for one year for work in specific hospitals. South Dakota grants temporary permits for practice in an emergency area for four years. Texas will grant a permit valid until the next board meeting. North Dakota on Jan. 1, 1952, discon-

tinued the granting of permits to displaced foreign physicians for practice in specified areas until citizenship is completed.

There were 676 permits issued by 19 boards. Seven boards did not report the issuance of any permits in 1951.

TABLE 22.—*Medical Schools Requiring an Internship*

United States
College of Medical Evangelists
University of Southern California School of Medicine
Stanford University School of Medicine
Chicago Medical School
University of Minnesota Medical School
Duke University School of Medicine [1]
Canada
University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
University of Ottawa Faculty of Medicine
University of Montreal Faculty of Medicine

1. Degree not withheld until internship completed.

Medical License Fees

Table 27 lists for each state, territory, and possession the fee charged by the medical licensing board for registration by examination and also by reciprocity or endorsement of credentials. The written examination fee tends to be uniform, the majority of the boards charging a fee of $25. The fee for a license by reciprocity or endorsement of credentials varies from $20 to $200, the majority charging a fee of $50. Five states—Florida, Missouri, New York, Texas, and Wisconsin—reported an increase in the fee charged for the written examination, and three states—Missouri, New York, and Wisconsin—an increase in the fee charged for a license without written examination. Three states reported the minimum fee charged for a license without examination but indicate, however, that the charge for such a license would be the same as that exacted by the reciprocating state if more than the minimum specified. Three states have a lower fee for those being certified on the basis of the certificate of the National Board of Medical Examiners than candidates licensed by reciprocity or state licenses.

TABLE 23.—*Medical Licensing Boards Requiring a One Year Internship* *

Alabama	Nevada	Vermont
Arizona	New Hampshire	Washington [1]
California	New Jersey [1,3]	West Virginia
Colorado	North Dakota	Wisconsin
Delaware [1]	Oklahoma [1]	Wyoming
District of Columbia	Oregon	Alaska [4]
Idaho	Pennsylvania [1]	Guam
Illinois [1]	Rhode Island [1]	Hawaii
Iowa [1]	South Dakota	Puerto Rico [1]
Kentucky	Utah	Virgin Islands
Michigan [1,2]		

* Some states require the internship for graduates of medical faculties abroad and from reciprocity or endorsement applicants.
1. Internship must be a rotating service.
2. Twenty-four month mixed or straight internship acceptable.
3. Two year residency in a specialty or one year of postgraduate work accepted.
4. Active practice for four years accepted in lieu of internship.

Licensure on Government Credentials

In most of the states no provision is made in the medical practice act for the acceptance of government credentials as a basis for licensure without examination. Eleven licensing boards, however, will issue a license to a physician who has passed an examination for admission to the medical corps of the United States Army and Navy, the Public Health Service, or the Veterans Administration. These boards are in Alabama, California, Illinois, Iowa, Pennsylvania, Rhode Island, Texas, Utah, Virginia, Wisconsin, and Puerto Rico.

Annual Registration

Thirty-three states, the District of Columbia, Alaska, and Hawaii require physicians to register their licenses annually or biennially. In table 28 are listed the licensing boards which exact this requirement and the fee charged for such registration. Vermont initiated this requirement in 1951. Some of these boards require such registration whether or not physicians reside in the state. The fee ranges from 1 to $10. Five states have a nonresident fee. Missouri, New York, and West Virginia require biennial registration.

TABLE 24.—*States Exacting Licensure, Registration or Other Requirements of Interns and Residents in Hospitals*

Requirements for Interns

Licensure Required		
Florida [3]	Indiana	New Jersey [5]
Georgia	Minnesota [3]	Puerto Rico
	Nevada [4]	
Required to Register with Licensing Board		
California	Delaware	West Virginia [6]
Colorado [1]	Massachusetts	

1. Not to exceed four years.
2. May serve for three years without licensure.
3. Not required if internship is being served for M.D. degree of University of Minnesota.
4. Temporary certificate for one year specific hospital granted.
5. May serve for two years without licensure.
6. Graduates of foreign medical schools required to obtain permission from licensing board.

Requirements for Residents in Hospitals

Licensure Required		
Arkansas	Kansas	New Mexico
California	Kentucky	North Dakota
Connecticut [2]	Louisiana	Ohio
Georgia	Maryland [2]	Pennsylvania
Idaho	Massachusetts	Texas
Illinois	Michigan	Washington
Indiana	Minnesota	Wisconsin
Iowa	Mississippi	Puerto Rico
Other Requirements		
Colorado [1]	Maine [6]	Oklahoma [11]
Delaware [3]	Nebraska [7]	Rhode Island [12]
Dist. of Columbia [4]	Nevada [8]	South Carolina [13]
Florida [5]	New Jersey 9	Virginia [5]
Illinois [6]	North Carolina [10]	West Virginia [14]

1 Registration with licensing board required annually not to exceed four years.
2. Customarily required by hospitals.
3. Registration with licensing board required.
4. Hospitals must notify licensing board.
5. May serve for three years without licensure.
6. Temporary certificate issued.
7. Licensure recommended.
8. Temporary certificate for one year in specific hospital.
9. May serve for two years without licensure.
10. Limited license granted.
11. Temporary permit granted for one year; may be renewed for two additional years.
12. One year of service allowed without licensure.
13. Must be licensed in some state in six months.
14. Foreign graduates required to obtain permission from licensing board.

Licensure of Foreign-Trained Physicians

In February, 1950, the Council on Medical Education and Hospitals and the Executive Council of the Association of American Medical Colleges first published a list of foreign medical schools whose graduates they recommend for consideration on the same basis as graduates of approved medical schools in the United States. In the preparation of this initial list, and the two subsequent revisions, these agencies have had the cooperation of an Advisory Committee on Foreign Medical Credentials. Eighteen organizations and governmental agencies, in addition to the two Councils, are represented on the com-

TABLE 25.—*Schedule of Written Examination Dates and Issuance of Licenses by Reciprocity or Endorsement of Credentials*

	Written Examination	Licenses by Reciprocity or Endorsement Issued
Alabama	Annually	Continuously
Arizona	Quarterly	Quarterly
Arkansas	Semi-annually	Continuously
California	Quarterly	Five meetings annually
Colorado	Semi-annually	Quarterly
Connecticut	March, July and Nov.	Continuously
Delaware	Semi-annually	Semi-annually
District of Columbia	Semi-annually	Quarterly
Florida	Semi-annually	No reciprocity
Georgia	June and October	Three times annually
Idaho	Semi-annually	Semi-annually
Illinois	Quarterly	Quarterly
Indiana	Annually, June	Every 6 weeks to 2 months
Iowa	June and December	Every 2 months
Kansas	Semi-annually	Semi-annually
Kentucky	Semi-annually	Bi-monthly
Louisiana	June and December	June and December
Maine	March, July and Nov.	March, July and November
Maryland	Semi-annually	Every 3 to 4 weeks
Massachusetts	January and July	Monthly except August
Michigan	June and October	Continuously
Minnesota	Quarterly	Quarterly
Mississippi	June	June and December
Missouri	Periodically	Periodically
Montana	April and October	April and October
Nebraska	Once annually in June	Quarterly
Nevada	Quarterly	Quarterly
New Hampshire	March and December	March and December
New Jersey	June and October	Monthly except August
New Mexico	Semi-annually	Semi-annually
New York	Jan., June and Oct.	Continuously
North Carolina	June	Five times annually
North Dakota	Semi-annually	Semi-annually
Ohio	June and December	Quarterly
Oklahoma	Annually	Quarterly
Oregon	Semi-annually	Quarterly
Pennsylvania	January and July	Monthly
Rhode Island	Quarterly	Eight meetings annually
South Carolina	Semi-annually	Monthly
South Dakota	Semi-annually	Semi-annually
Tennessee	Quarterly	Continuously
Texas	Twice annually	4 or 5 meetings annually
Utah	Annually, July	3 or 4 meetings annually
Vermont	Twice annually	Continuously
Virginia	Twice annually	Twice annually
Washington	January and July	January and July
West Virginia	Quarterly	Quarterly
Wisconsin	Twice annually	Twice annually
Wyoming	June and October	June and October
Alaska	June and September	Twice annually
Canal Zone	As needed	As needed
Guam	On application	On application
Hawaii	January and July	Continuously
Puerto Rico	Semi-annually	Quarterly
Virgin Islands	Twice annually	Twice annually

TABLE 26.—*Temporary Permits, 1951*

State	Permit Valid for:	Permits Granted
Arizona	Next board meeting	53 [1]
Delaware	Four months [5]	6
Florida	Six months	9
Georgia	Next board meeting	0
Idaho	Next board meeting	26
Illinois	Limited license for practice in state hospitals; temporary certificate for postgraduate and specialty training	1
Indiana [2]	Six months	147
Kansas	Next board meeting	0
Kentucky	1-5 years—limited license	0
Louisiana	Until completion of internship	94
Maine	One year	9
Mississippi	Next board meeting	62
Nebraska [3]	Until licensure is perfected	0
Nevada	One year for work in specific hospitals	3
New Hampshire	Varies	0
New Jersey	Two weeks to four months	7
New Mexico	Six months	38
North Carolina	Limited license for residents and for practice in a prescribed territory for a definite period of time	53
Oklahoma	One year for hospital residents [3]	7
South Dakota	For practice in an emergency area for four years	3
Texas	Next board meeting	40
Virginia [2]	Next board meeting	70
West Virginia	Next board meeting	0
Alaska	Next board meeting	14
Puerto Rico	Until 1955	26
Virgin Islands [4]	Six months	0
Totals		676

1. Includes 6 limited licenses.
2. Reciprocity applicants.
3. May be renewed for two additional years.
4. Government positions only.
5. Permit granted for one year if emergency exists.

mittee. The current list, revised to December, 1951, is contained in table 29. The present list is not final, and it will be supplemented as information is obtained regarding other schools and evaluated by the interested agencies. Since the list is still a preliminary one and other

TABLE 27.—*Medical Licensure Fees*

	Examination	Reciprocity or Endorsement
Alabama	$10	$ 50
Arizona	25	100
Arkansas	25	50 [1]
California	25	100
Colorado	25	50
Connecticut	25	50 [2]
Delaware	25	100
District of Columbia	25	50
Florida	50	...
Georgia	20	50
Idaho	25	100
Illinois	15	25
Indiana	25	50
Iowa	25	50
Kansas	25	50
Kentucky	25	50
Louisiana	25	50 [1]
Maine	25	50
Maryland	20	50
Massachusetts	25	50 [2]
Michigan	25	50
Minnesota	20	75
Mississippi	10	50
Missouri	25	100 [2]
Montana	50	75
Nebraska	25	50
Nevada	100	200
New Hampshire	20	20
New Jersey	25	100
New Mexico	50	50
New York	30	30
North Carolina	15	50
North Dakota	25	50
Ohio	25	50
Oklahoma	25	100
Oregon	25	100
Pennsylvania	25	50
Rhode Island	20	20
South Carolina	25	50
South Dakota	20	50
Tennessee	25	50
Texas	40	50
Utah	25	50
Vermont	20	50
Virginia	25	50
Washington	25	25
West Virginia	25	100
Wisconsin	45	75 [1]
Wyoming	25	50
Alaska	25	100
Guam	50	50
Hawaii	25	25
Puerto Rico	30	30
Virgin Islands	65	50

1. Minimum.
2. Endorsement of certificate of National Board of Medical Examiners $25.

TABLE 28.—*States Requiring Annual Registration*

	Fee		Fee		Fee
Arizona	$ 5	Kansas	$ 1	Pennsylvania	$ 1
Arkansas	a	Louisiana	2	Tennessee	5
California	2	Minnesota	2	Texas	2
Colorado	b	Missouri *	5	Utah	3
Connecticut	2	Montana	5	Vermont	2
Delaware	10	Nebraska	1	Virginia	1
Dist. of Columbia	2	Nevada	5	Washington	10
Florida	1	New Mexico	d	West Virginia *	2
Georgia	None	New York *	4	Wisconsin	3
Idaho	10	North Dakota	e	Wyoming	2.50
Indiana	c	Oklahoma	3	Alaska	10
Iowa	1	Oregon	10	Hawaii	2

a. Residents $2, Nonresidents $4.
b. Residents $2, Nonresidents $10.
c. Residents $5, Nonresidents $10.
d. Residents $2, Nonresidents $5.
e. Residents $5, Nonresidents $2.
* Biennial registration.

institutions will undoubtedly be added in the future, the position of the Council and the Executive Council with respect to schools not on this list is that they neither approve nor disapprove these schools but must leave to the individual institutions and organizations in the United States the decision whether they will accept graduates of

these schools on the same basis as they accept graduates of approved medical schools in the United States. Forty-nine schools in 13 countries comprise the present listing.

Twenty-three licensing boards have reported the acceptance of this list in the consideration of applicants for licensure. Twelve boards stipulate that recognition is limited to graduates of schools on the list; two boards specify that graduates of foreign medical faculties after Jan. 1, 1940, are not eligible for licensure unless they have graduated from a school on the published list or have done some special work in an approved medical school in the United States or in a recognized hospital; and one board will accept other graduates if they possess either a certificate of the National Board of Medical Examiners or one of the American boards in the specialties. The remaining eight boards have reported they accept the list but do not specify whether they also accept graduates of other schools. Foreign-trained physicians are not eligible for licensure in 11 states.

The present requirements for candidates seeking medical licensure in the United States and its territories and outlying possessions on the basis of credentials obtained in countries other than the United States and Canada are given in table 30. Forty-three boards will admit foreign physicians to the licensing examination under varying conditions. Arizona, Maine, North Carolina, and West Virginia, which heretofore did not license foreign-trained physicians, have indicated that they will now accept applications for licensure. In other states, the regulations have been modified to enable qualified physicians to obtain the right to practice medicine. Nine boards do not require citizenship, while 22 boards require full citizenship. Twelve boards require that the applicant file first citizenship papers only. North Dakota, which requires

TABLE 29.—*Foreign Medical Schools*

List Prepared by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges

On the basis of information presently available, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges are of the opinion that medical institutions and medical organizations in the United States would be justified in considering current and past graduates of the following foreign medical schools on the same basis that they consider graduates of approved medical schools in the United States. This list is not final and will be supplemented as information is compiled for other schools.

Belgium

Free University of Brussels Faculty of Medicine
(Université Libre de Bruxelles Faculté de Médecine)
Catholic University of Louvain Faculty of Medicine
(Université Catholique de Louvain Faculté de Médecine or
Katholieke Universiteit te Leuven)
University of Ghent Faculty of Medicine
(Universiteit te Gent Faculteit der Geneeskunde, or
Université de Gand Faculté de Médecine)
University of Liège Faculty of Medicine
(Université de Liège Faculté de Médecine)

Brazil

University of São Paulo Faculty of Medicine
(Universidade de São Paulo Faculdade de Medicina)

Denmark

University of Copenhagen Faculty of Medicine
(Kobenhavns Universitet Laegevidenskabelige Fakultet)

Finland

University of Helsinki Faculty of Medicine
(Helsingfors Universitet Medicinska Fakulteten)
Medical Faculty Turku University
(Turun Yliopiston Laaketieteellinen Tiedekunta)

Lebanon

American University of Beirut School of Medicine

Netherlands

University of Amsterdam Faculty of Medicine
(Universiteit van Amsterdam Geneeskunde Faculteit)
State University of Groningen Faculty of Medicine
(Rijks-Universiteit te Groningen Medische Faculteit)
State University of Leiden Faculty of Medicine
(Rijks-Universiteit te Leiden Faculteit der Geneeskunde)
State University of Utrecht Faculty of Medicine
(Rijks-Universiteit te Utrecht Faculteit der Geneeskunde)

Norway

University of Oslo Faulty of Medicine
(Kongelige Frederiks Universitet Medisinske Fakultet)

Sweden

Royal Charles University Medical Faculty, Lund
(Kungl. Karolinska Universitetet Medicinska Fakulteten)
Charles Medico-Surgical Institute, Stockholm
(Karolinska Mediko-Kirurgiska Institutet)
Royal University of Uppsala Medical Faculty
(Kungl. Universitetet i Uppsala Medicinska Fakulteten)

Switzerland

The recommendation with respect to the following medical schools in Switzerland applies only to those graduates of Swiss medical schools who hold the Swiss Federal Diploma issued by the Federal Department of the Interior (Eidgendoissisches Department Des Innern, Département Fédéral de L'Intérieur) and obtainable only by Swiss citizens who hold the Certificate of Medical Studies (Akademische Zeugnis, Certificat d'Études Médicales), or who hold one of the following certificates which the Swiss Universities issue to those, not citizens of Switzerland, who complete a course of study and pass examinations equivalent to those taken by Swiss citizens in qualifying for the Swiss Federal Diploma:

University of Basel—Academic Certificate on passing the medical examination for physicians (Akademische Zeugnis uber die bestandene Fachprufung für Ärzte).

University of Bern—Medical diploma on passing examination for medicine (Aerztliches Fakultats diplom uber die bestandene Fachprufung für Ärzte).

University of Geneva and University of Lausanne—Certificate of Medical Studies (Certificat d'Études Médicales).

University of Zurich—Medical diploma for Foreigners (Medizinisches Diplom für Ausländer).

University of Basel Faculty of Medicine
(Universität Basel Medizinische Fakultät)
University of Bern Faculty of Medicine
(Universität Bern Medizinische Fakultät)
University of Geneve Faculty of Medicine
(Université de Genève Faculté de Médecine)
University of Lausanne Faculty of Medicine
(Université de Lausanne Faculté de Médecine)
University of Zurich Faculty of Medicine
(Universität Zurich Medizinische Fakultät)

United Kingdom

The recommendation applies only to those physicians trained in the United Kingdom who hold medical degrees from the universities listed. The recommendation does not apply to those physicians who received their medical training at these universities or their affiliated hospital medical schools but who did not complete the work for the degree and who obtained their qualifications only through the examinations of the licensing corporations of the United Kingdom.

England

University of Birmingham Faculty of Medicine
University of Bristol Faculty of Medicine
University of Cambridge Faculty of Medicine
University of Durham Medical School, Newcastle-upon-Tyne
University of Leeds Faculty of Medicine
University of Liverpool Faculty of Medicine
University of London †
University of Manchester Faculty of Medicine
University of Oxford Faculty of Medicine
University of Sheffield Faculty of Medicine

Northern Ireland

Queen's University of Belfast Faculty of Medicine

Scotland

University of Aberdeen Faculty of Medicine
University of Edinburgh Faculty of Medicine
University of Glasgow Faculty of Medicine
University of St. Andrews Medical School, St. Andrews and Dundee

Wales

Welsh National School of Medicine, University of Wales, Cardiff

† Work for the medical degree of the University of London is offered at the following hospital medical schools:

Charing Cross Hospital Medical School
Guy's Hospital Medical School
King's College Hospital Medical School
London Hospital Medical School
Middlesex Hospital Medical School
Royal Free Hospital School of Medicine
St. Bartholomew's Hospital Medical College
St. George's Hospital Medical School
St. Mary's Hospital Medical School
St. Thomas' Hospital Medical School
University College Hospital Medical School
Westminster Hospital Medical School

TABLE 30.—Requirements of Candidates for Medical Licensure on the Basis of Credentials Obtained in Countries Other Than the United States and Canada

	Admitted to Examination	Admitted by Endorsement of State License *	Citizenship	Basic Science Certificate	Internship or Residency in Hospital in United States	Further Medical Training	Examination Fee, Dollars	Footnotes
Alabama	x	..	x	..	x	..	10	1
Arizona	x	..	1stP	x	x	..	25	30
Arkansas	Not accepted [35]							
California	x	x	x	..	x	..	25	2
Colorado	x	..	x	x	x	x	25	7, 12, 25
Connecticut	x	x	1stP	x	..	..	25	28
Delaware	x	..	x	..	x	x	25	4, 7
District of Columbia	x	x	..	x	x	..	25	5, 24
Florida	x	..	x	x	..	..	50	3, 28
Georgia	x	x	x	..	..	..	20	24
Idaho	Not accepted							
Illinois	x	..	1stP	..	x [39]	..	15	39
Indiana	x	..	..	..	..	x	25	7
Iowa	x	..	x	x	x	x	25	8, 26
Kansas	x	..	x	..	x	..	25	9
Kentucky	Not accepted							
Louisiana	Not accepted							
Maine	x	x	..	..	..	..	25	28
Maryland	x	..	1stP	..	x	x	20	6, 26
Massachusetts	x	..	1stP	..	..	..	25	29
Michigan	x	..	..	x	x	x	25	7, 36
Minnesota	x	..	1stP	x	x	..	20	12
Mississippi	x	..	x	..	..	..	10	24
Missouri	x	..	x	..	x	..	25	12
Montana	Not accepted							
Nebraska	x	..	x	x	..	..	25	22, 28
Nevada	Not accepted							
New Hampshire	x	x	x	..	x	..	30	14, 28, 34
New Jersey	x	x	x	..	x	..	25	13, 15
New Mexico	x	..	1stP	x	..	..	50	27
New York	x	x	1stP	..	..	..	30	16, 28
North Carolina	x	..	..	..	..	..	15	24, 32
North Dakota	x	..	x	..	x	x	25	11, 17, 31
Ohio	x	x	x	..	..	..	25	28, 33
Oklahoma	Not accepted							
Oregon	x	..	x	x	x	..	25	24
Pennsylvania	x	..	1stP	..	x	..	25	19, 28
Rhode Island	x	..	1stP	x	x	x	20	10, 20
South Carolina	Not accepted							
South Dakota	x	..	..	x	x	..	20	18, 24
Tennessee	x	..	x	x	..	..	25	24
Texas	x	..	..	x	..	..	25	21
Utah	Not accepted							
Vermont	Not accepted [14]							
Virginia	x	..	1stP [23]	..	..	..	25	20
Washington	x	..	..	x	x	..	25	24
West Virginia	x	..	x	..	x	..	25	28, 40
Wisconsin	x	..	1stP	x	x	..	25	24
Wyoming	Not accepted							
Alaska	x	x	x	x	x	..	25	24
Guam	x	x	x	..	x	..	50	24
Hawaii	x	..	x	..	x	..	25	14, 24
Puerto Rico	x	x	x	..	x	x	30	37
Virgin Islands	x	..	..	..	x	..	65	24

This summary should be supplemented by direct communication with the secretary of the licensing board of the state in which the physician is interested.

x. Implies Yes.

* Refer to chart "Reciprocity and Endorsement Policies" for further data.

1. Candidate is eligible if his credentials have been appraised by the National Board of Medical Examiners and approved.

2. (a) Citizenship waived if country in which applicant is licensed will admit to licensure citizens of the United States. (b) Acceptable for reciprocal registration if license submitted was granted on same standards as in effect in California on the same date and upon completion of an oral, clinical and written examination. (c) Internship in United States satisfactory to the board.

3. Graduates of foreign medical schools not on approved list are considered individually and may be accepted if they have had postgraduate training in the United States to qualify for certification by one of the American specialty boards, or at least a three year residency in an approved hospital.

4. Residence of one year in Delaware required.

5. (a) Acceptable for reciprocal registration if similar privileges are accorded licentiates of District of Columbia by licensing agency or jurisdiction from which the applicant comes. (b) Regulations cited refer also to graduates of Canadian schools.

6. Graduates of South or Central America required to obtain medical degree from approved medical school in the United States.

7. Further training—Completion of senior year in approved medical school in the United States.

8. Further training—Internship or one year in medical school in the United States.

9. (a) Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States. (b) In lieu of internship, certificate from three graduates of the applicant's medical school licensed to practice medicine in United States accepted.

10. Must serve one year internship in approved hospital in U. S. and pursue postgraduate study or serve additional one year internship or residency.

11. Citizenship requirements waived for displaced physicians.

12. Credentials must be submitted in original form and accompanied by translation, and will be directly verified or documents should bear evidence of being visaed by the U. S. Consul in the country wherein the school of graduation is or was located.

13. Must submit original certificate covering medical courses, original diploma and license to practice in the foreign country with translations made by the Lawyers' and Merchants' Translation Bureau, New York City.

14. Diplomates of National Board of Medical Examiners eligible on reciprocity basis.

15. (a) Internship completed in foreign countries after July 1, 1934 not acceptable: (b) Graduates of medical schools of Europe and Asia prior to Nov. 19, 1941 accepted. (c) Graduates of medical schools of South American Republics, Mexico, Cuba and Switzerland not accepted.

16. Graduates of continental European medical schools after Jan. 1, 1940 not acceptable. Graduates of medical schools in Mexico and Latin and South America required to complete two years of approved internship or one year of postgraduate medical study.

17. License to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States.

18. Applicant required to practice in an emergency area for four years under a temporary license and reappear before the board for permanent licensure.

19. Medical education completed in foreign medical schools since 1941 not acceptable.

20. (a) Matriculants in foreign medical faculties subsequent to Jan. 1, 1949 not acceptable. (b) Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located.

21. European graduates after 1939 limited to English speaking schools.

22. Internship of one year in an approved hospital in the United States after acquiring full citizenship required. If application is accepted, the board has established basic recommendations which must be met prior to citizenship.

23. This requirement may be waived.

24. Recognition limited to graduates of schools accepted by Council on Medical Education and Hospitals of the American Medical Association and Executive Council of Association of American Medical Colleges.

25. Graduates of foreign medical schools after Jan. 1, 1940 not accepted.

26. Graduates of foreign medical schools are considered individually. Graduates of medical schools in Europe who obtained the medical degree after Jan. 1, 1940 are not eligible unless they have graduated from one of the schools listed by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges, or have done some special work in an approved medical school in the United States or a recognized hospital.

27. Graduates of foreign medical schools not included on list issued by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges may be accepted if they possess either a certificate of the National Board of Medical Examiners or the certificate of one of the American boards in the specialties.

28. List of foreign medical schools prepared by the Council on Medical Education and Hospitals of the American Medical Association and Executive Council of the Association of American Medical Colleges accepted.

29. Graduates of foreign medical schools who matriculated in medical school prior to Jan. 1, 1941 are eligible to apply for admission to the examinations. Graduates after Jan. 1, 1941 must be graduates of a medical school approved by the Approving Authority for Colleges and Medical Schools of the Commonwealth of Massachusetts. The Approving Authority has not approved any foreign medical schools.

30. Permissible by law at the discretion of the board. A graduate of a foreign medical school who has served in the Armed Forces of the United States and has an honorable discharge is eligible for licensure.

31. Graduates of continental European medical schools after 1939 not accepted.

32. Considered on an individual basis.

33. Graduates of medical schools of continental Europe prior to 1944 not accepted. Required to hold license to practice in foreign country.

34. Temporary license valid until citizenship is completed may be given.

35. Eligible for licensure by Homeopathic State Medical Board. Citizenship, one year internship and basic science certificate required.

36. Further training.—Completion of senior year in approved medical school in the United States or Canada; or M.S. or D.S. degree in basic science or clinical medicine from graduate school affiliated with approved medical school; or in lieu of above, certificate of a comprehensive examination in basic sciences and clinical medicine by a joint screening board of examiners from the faculties of medical schools of University of Michigan and Wayne University.

37. Further training—required at the discretion of the board.

38. Approved rotating internship in Illinois required.

39. Limited license issued for practice in hospitals maintained by the state.

40. Applicant shall have resided in West Virginia for at least three years immediately preceding application and must be recommended by local medical society.

Marginal Number	SCHOOL	Arizona P	Arizona F	California P	California F	Colorado P	Colorado F	Connecticut P	Connecticut F	Delaware P	Delaware F	Dist. of Columbia P	Dist. of Columbia F	Florida P	Florida F	Georgia P	Georgia F	Illinois P	Illinois F	Indiana P	Indiana F	Iowa P	Iowa F	Maine P	Maine F
	ARGENTINA																								
1	Universidad Nacional, Rosario	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
	AUSTRIA																								
2	Karl-Franzens-Universität, Graz	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..
3	Universität Wien	..	..	1	3	1	0	0	3	..	..	..	..	..	..	1	0	8	2	..	..	..	..	0	1
4	Universität Innsbruck	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..
	BELGIUM																								
5	Université de Bruxelles	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	Université de Ghent	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	Université de Liège	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	BULGARIA																								
8	University of Sofia	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CHINA																								
9	Aurora University, Shanghai	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	Cheeloo University, Shantung	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..
11	Hackett Medical College for Women, Canton	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	Hsiang Ya Medical College, Changsha	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	Military Medical College (National Defense Center, Formosa) Nanking	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	National College of Medicine of Shanghai	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	National Sun Yat-sen University, Canton	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	Peiping Union Medical College	..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
17	Pennsylvania Medical School, Shanghai	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	St. John's University, Shanghai	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	Women's Christian Medical College, Shanghai	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	COLOMBIA																								
20	Universidad de Antioquia, Medellin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	Universidad de Cartagena	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CUBA																								
22	Universidad de la Habana	..	..	2	1	..	..	1	1	..	..	..	..	3	0	..	..	11	11	..	..	..	..	..	..
	CZECHOSLOVAKIA																								
23	Universita Komenského, Bratislava	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	Masarykova Universita, Brno	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	Deutsche Universität, Prague	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	4	1	..	..	..	..	0	1
26	Universität Karlova, Praha	..	..	..	..	..	..	1	0	..	..	..	..	1	0	..	..	2	3	..	..	..	..	..	..
	DENMARK																								
27	Kobenhavns Universitet	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	DOMINICAN REPUBLIC																								
28	Universidad de Santo Domingo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ECUADOR																								
29	Universidad Central, Quito	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	2	0	..	..	..	..	..	..
30	Universidad Guayaquil	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
	EL SALVADOR																								
31	Universidad de El Salvador	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..
	ENGLAND																								
32	University of Bristol	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
33	University of Cambridge	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
34	University of Durham (Kings College)	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
35	University of Leeds	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
36	University of London	..	..	2	0	..	..	..	..	..	..	1	0	0	2	..	..	..	..	..	..	..	..	..	..
37	University of Manchester	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
38	Licentiate, Royal College of Physicians of London and Member, Royal College of Surgeons of England	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
39	Licentiate, Apothecaries' Society of London	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ESTONIA																								
40	Tartu Ulikooli	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	1	2	..	..	..	..	..	..
	FINLAND																								
41	Helsingfors Universitet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
	FRANCE																								
42	Université de Montpellier	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
43	Université de Nancy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
44	Université de Paris	..	..	0	1	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
45	Université de Strasbourg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
	GERMANY																								
46	Friedrich-Wilhelms-Universität, Berlin	..	..	..	..	1	1	1	0	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..
47	Rhenische Friedrich-Wilhelms-Universität, Bonn	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..
48	Schlesische-Friedrich-Wilhelms-Universität, Breslau	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
49	Medizinische Akademie Düsseldorf	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..
50	Johann Wolfgang Goethe-Universität, Frankfurt-am-Main	..	..	1	0	..	..	0	1	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
51	Friedrich-Alexanders-Universität, Erlangen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
52	Albert-Ludwigs-Universität, Freiburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
53	Georg August-Universität, Göttingen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..
54	Hamburgische Universität	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
55	Universität-Heidelberg	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..
56	Thuringische Landesuniversität, Jena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
57	Universität-Köln	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..
58	Albertus-Universität, Königsberg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
59	Universität-Leipzig	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
60	Philipps-Universität, Marburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
61	Ludwig Maximillians-Universität, München	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	4	2	..	..	..	..	..	..
62	Westfalische Wilhelms-Universität, Münster	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
63	Universität-Rostock	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
64	Eberhard-Karls-Universität Tübingen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	4	..	..	..	..	..	..
65	Julius-Maximilians-Universität, Wurzburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
	GREECE																								
66	National University of Athens	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	4	..	..	..	..	..	..
	HAITI																								
67	École Nationale de Médecine, Port-au-Prince	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
	HUNGARY																								
68	Magyar Királyi Pázmány Petrus Tudományegyetem, Budapest	..	..	1	1	..	..	1	0	..	..	1	0	1	0	..	..	2	1	..	..	..	..	..	..
69	Magyar Királyi Tisza-István Tudományegyetem, Debrecen	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
70	Magyar Királyi Erzébet Tudományegyetem, Pecs	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
71	Magyar Királyi Ferencz Jozsef Tudományegyetem, Szeged	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
	INDIA																								
72	Woman's Christian Medical College, Punjab	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
	IRAN																								
73	Madresseh Teb, Teheran	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	IRAQ																								
74	Royal Iraq Medical College, Bagdad	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Maryland		Massachusetts		Michigan		Minnesota		Mississippi		Missouri		Nebraska		New Hampshire		New Jersey		New York		North Carolina		North Dakota		Ohio		Oklahoma		Pennsylvania		Rhode Island		South Dakota		Texas		Virginia		Washington		West Virginia		Wisconsin		Alaska		Totals	Examined—Passed	Examined—Failed	Percentage Failed	Number of Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
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1	1	0	2	..	..	..	..	..	..	1	0	..	..	..	..	..	..	19	25	..	..	0	1	1	1	1	0	1	0	..	..	..	..	1	0	..	..	..	..	2	0	..	..	77	38	39	50.6	16	3
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3	1	25.0	1	4
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	5
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	6
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	7
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	3	2	40.0	3	8
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	9
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	10
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	11
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	2	12
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	13
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	14
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	1	15
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	3	0	0.0	3	16
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	17
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	3	3	0	0.0	3	18
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	19
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	20
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	21
..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	0	1	..	..	..	..	..	..	..	..	0	1	35	20	15	42.9	9	22
..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	2	1	33.3	2	23
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	24
0	1	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32	16	16	50.0	6	25
1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	15	15	50.0	5	26
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	2	1	33.3	3	27
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	3	1	2	66.7	2	28
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	4	0	0.0	3	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	2	1	33.3	2	31
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	2	32
..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	2	33
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	2	1	33.3	2	34
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	1	0	0.0	1	35
..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	9	7	2	22.2	7	36
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	37
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	3	3	0	0.0	2	38
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	39
..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	8	..	..	2	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	15	8	7	46.7	7	40
..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	4	3	1	25.0	4	41
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	42
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	2	2	50.0	1	43
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	3	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	5	3	37.5	4	44
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3	1	25.0	2	45
0	2	0	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	12	15	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40	18	22	55.0	8	46
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	2	66.7	1	47
1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	7	6	46.2	4	48
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	1	49
1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	2	1	0	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	6	5	45.5	7	50
..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3	1	25.0	3	51
..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	2	1	33.3	3	52
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	5	3	2	40.0	2	53
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	6	2	4	66.7	4	54
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	5	3	37.5	3	55
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	56
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	0	4	100.0	3	57
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	58
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	2	3	60.0	2	59
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3	1	25.0	3	60
..	..	1	1	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	5	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	21	11	10	47.6	7	61
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	62
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	2	100.0	1	63
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	9	4	30.8	1	64
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	2	100.0	2	65
..	..	0	2	1	0	..	..	..	..	..	..	..	..	0	1	1	0	1	3	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17	6	11	64.7	7	66
..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	2	100.0	2	67
1	2	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	11	..	..	0	1	4	3	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	0	41	19	22	53.7	12	68
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	3	4	57.1	3	69
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	2	5	71.4	3	70
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	3	4	57.1	4	71
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	72
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	73
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	74

Marginal Number	SCHOOL	Arizona P	Arizona F	California P	California F	Colorado P	Colorado F	Connecticut P	Connecticut F	Delaware P	Delaware F	Dist. of Columbia P	Dist. of Columbia F	Florida P	Florida F	Georgia P	Georgia F	Illinois P	Illinois F	Indiana P	Indiana F	Iowa P	Iowa F	Maine P	Maine F
	IRELAND																								
75	National University of Ireland	..	..	3	0	..	..	1	0	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..
76	University of Dublin	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	Queen's University, Belfast	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78	Licentiate of Apothecaries' Hall, Dublin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ITALY																								
79	Regia Università di Bari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
80	Regia Università di Bologna	..	..	4	1	..	..	0	1	..	..	..	..	..	..	..	..	1	0	..	..	..	..	0	1
81	Regia Università di Catania	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
82	Regia Università di Firenze	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
83	Regia Università di Genova	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
84	Regia Università di Messina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
85	Regia Università di Modena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
86	Regia Università di Napoli	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
87	Regia Università di Padova	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
88	Regia Università di Parma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
89	Regia Università di Pavia	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
90	Regia Università di Palermo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
91	Regia Università di Pisa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
92	Regia Università di Roma	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1
93	Regia Università di Siena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
94	Regia Università di Turin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	JAPAN																								
95	Keio Gijiku University, Tokyo	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
96	Tokyo Charity Association Medical College	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	LATVIA																								
97	University of Riga	..	..	5	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
	LEBANON																								
98	American University of Beirut	..	..	1	1	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
	LITHUANIA																								
99	Vytauto Didziojo Universiteto, Kaunas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	14	..	..	..	..	..	..
	MEXICO																								
100	Universidad de Guadalajara	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
101	Escuela Libre de Homeopatia, Mexico City	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
102	Escuela Médico Militar, Mexico City	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
103	Universidad Nacional, Mexico City	..	..	3	5	..	..	..	..	..	..	..	..	1	0	..	..	3	3	..	..	..	..	..	..
104	Escuela de Medicina de Nuevo Leon, Monterrey	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
	NETHERLANDS																								
105	Rijks-Universiteit te Groningen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
106	Rijks-Universiteit te Leiden	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
107	Rijks-Universiteit te Utrecht	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NEW ZEALAND																								
108	University of New Zealand, Dunedin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NICARAGUA																								
109	Universidad de Nicaragua, Leon y en Granada	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NORWAY																								
110	Universitet Oslo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PARAGUAY																								
111	National University of Paraguay, Asuncion	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PERU																								
112	Universidad Mayor de San Marcos, Lima	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PHILIPPINES																								
113	University of Santo Tomas, Manila	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	0	1	0	1	..	..	..	..
114	University of the Philippines, Manila	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
	POLAND																								
115	Uniwersytet Jagiellónski, Cracow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
116	Uniwersytet Jana Kazimieraz, Lwow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
117	Uniwersytet Lemberg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
118	Uniwersytet Poznánski, Poznan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
119	Uniwersytet Jozefa Pilsudskiégo, Warszawa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
120	Uniwersytet Stefana Batorego, Wilno	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
	PORTUGAL																								
121	University of Coimbra	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	RUMANIA																								
122	Universitatea din Bucuresti	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	0	1	..	..	..	..	..	..
123	Universitatea din Cluj	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
124	Universitatea din Iasi	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SCOTLAND																								
125	University of Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
126	Licentiate Royal College of Physicians and Surgeons of Edinburgh and Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..
127	Polish School of Medicine, Edinburgh	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
128	St. Mungo's College Medical School, Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
129	University of St. Andrews, St. Andrews and Dundee	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SOUTH AFRICA																								
130	University of Witwatersrand, Johannesburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SPAIN																								
131	Central University, Madrid	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
132	University of Seville	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SWITZERLAND																								
133	Universität Basel	..	..	..	..	1	0	1	1	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..
134	Universität Bern	..	..	1	1	..	..	2	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
135	Université de Genève	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
136	Université de Lausanne	..	..	2	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
137	Universität Zurich	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	TURKEY																								
138	University of Istanbul	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	UNION OF SOCIALIST SOVIET REPUBLICS																								
139	Dnepropetrovsk Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
140	First Moscow Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
141	Kazan Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
142	Odessa Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
143	State University of Baku	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
144	Kharkov Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
	YUGOSLAVIA																								
145	Beogradskog Universiteta	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
146	Zagrebaskog Universiteta	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
	Totals	1		96		4		21		1		8		10		4		174		1		1		4	
	Totals—Examined—Passed	1		56		3		13		1		6		8		4		92		0		1		0	
	Totals—Examined—Failed	0		40		1		8		0		2		2		0		82		1		0		4	
	Percentage Failed	0.0		41.7		25.0		38.1		0.0		25.0		20.0		0.0		47.1		100.0		0.0		100.0	

Maryland		Massachusetts		Michigan		Minnesota		Mississippi		Missouri		Nebraska		New Hampshire		New Jersey		New York		North Carolina		North Dakota		Ohio		Oklahoma		Pennsylvania		Rhode Island		South Dakota		Texas		Virginia		Washington		West Virginia		Wisconsin		Alaska		Totals	Examined—Passed	Examined—Failed	Percentage Failed	Number of Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
4	0	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	14	1	6.7	6	75
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	76
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	1	0	0.0	1	77
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	78
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	3	100.0	1	79
..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	0	2	5	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	11	20	64.5	7	80
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3	1	25.0	2	81
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	82
0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	2	3	60.0	3	83
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	84
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	5	2	3	60.0	2	85
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	3	6	66.7	4	86
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	87
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	88
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	89
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	5	1	4	80.0	3	90
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	6	2	4	66.7	3	91
1	0	1	3	..	..	..	..	..	..	..	..	..	..	..	..	0	1	2	5	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	17	6	11	64.7	7	92
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	93
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	2	66.7	1	94
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	95
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	96
..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	8	13	..	..	1	1	4	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36	21	15	41.7	6	97
1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	11	9	2	18.2	6	98
2	2	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	8	15	..	..	..	..	11	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	74	31	43	58.1	5	99
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	2	66.7	2	100
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	101
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	102
..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	9	11	45.0	6	103
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	2	1	1	50.0	2	104
..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	3	1	2	66.7	2	105
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	106
1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	107
..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	108
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	109
1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	4	4	0	0.0	4	110
..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	111
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	112
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	3	100.0	3	113
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	4	1	20.0	3	114
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	3	..	..	2	0	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	10	4	28.6	4	115
2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	9	..	..	1	1	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27	13	14	51.9	5	116
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	1	0	1	100.0	1	117
0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	2	3	60.0	4	118
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12	7	5	41.7	2	119
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	2	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12	8	4	33.3	3	120
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	121
1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	3	2	40.0	4	122
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	123
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	124
..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	5	4	1	20.0	4	125
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	6	2	25.0	3	126
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	127
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	128
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	1	0	0.0	1	129
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	3	0	0.0	1	130
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	131
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	132
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	6	4	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	17	9	8	47.1	6	133
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	9	5	4	44.4	5	134
..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	5	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	8	6	42.8	4	135
..	..	0	2	..	..	..	..	..	..	1	0	..	..	..	..	0	1	0	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	4	7	63.6	6	136
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	8	5	3	37.5	2	137
..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	2	138
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	139
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	3	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	1	5	83.3	2	140
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	141
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	142
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	143
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	144
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	3	75.0	2	145
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	2	1	1	50.0	2	146
32		25		5		7		1		8		1		1		14		448		1		12		80		1		3		7		6		6		10		1		4		2		6		1,006	...	...	...	...	
18		6		4		7		1		8		1		0		7		192		1		8		46		1		3		7		3		4		10		1		4		2		5		...	524	...	...	...	
14		19		1		0		0		0		0		1		7		256		0		4		34		0		0		0		3		2		0		0		0		0		1		...	...	482	...	...	
43.7		76.0		20.0		0.0		0.0		0.0		0.0		100.0		50.0		57.1		0.0		33.3		42.5		0.0		0.0		0.0		50.0		33.3		0.0		0.0		0.0		0.0		16.7	...	...	...	47.9	...	

full citizenship, will waive this requirement for displaced physicians, and Virginia reported it may waive the requirement of first papers. Twenty-eight states indicate the foreign-trained physician must serve an internship or obtain further medical training in the United States. This chart has been developed in an effort to be of assistance to the foreign-trained physician seeking licensure in the United States. In connection with the state requirements of any one state, specific attention is called to the footnotes referred to in the last column which supplement the tabular data.

In the preparation of this table it was apparent that the licensure of foreign-trained physicians has been given serious consideration by the authorities in the various states, and in many states methods have been devised to provide for licensure without lowering the standards of medical practice in the United States. While an attempt has been made to present the situation as it exists, it should be borne in mind that this table is intended to present a summary of existing requirements, and physicians are urged to supplement the information contained in this table by direct communication with the licensing boards. It should further be understood that each application is considered individually by the licensing boards, so that this summary does not absolutely guarantee licensure in those states that have indicated foreign-trained physicians are eligible for licensure.

The states of Illinois, Iowa, South Dakota, and West Virginia have announced that they are attempting to aid displaced physicians to establish themselves in practice in those states. Illinois, Kentucky and South Dakota will issue temporary permits to foreign-trained physicians for work in institutions. In addition, the displaced physician may obtain help from the National Committee for Resettlement of Foreign Physicians, 15 Park Row, New York City.

Table 31 records the number of graduates of foreign medical faculties examined for medical licensure in the United States and Alaska in 1951. The figures include both American and foreign born physicians. Graduates of 142 medical schools and 4 licensing corporations were examined. Graduates of medical schools in the Philippines, 11 South and Central American countries, 27 countries in Europe, and 8 in Asia were represented at examinations. The number examined totaled 1,006. These physicians were tested in 34 states and Alaska. The number who were successful was 524; failures numbered 482, or 47.9%. This extremely high percentage of failures is a primary factor in the cautious attitude which has been maintained by licensing boards in admitting these graduates to the licensing examinations.

Graduates of the University of Vienna represented the largest group from any one school. Seventy-seven graduates of this school were examined in 16 states, 50.6% of whom failed. From Central America the school which represented the largest group was the University of Havana. Thirty-five graduates of this school were examined in nine states, with 42.9% failures.

The greatest number examined by any one state was 448 in New York, of whom 192 passed and 256, 57.1%, failed. Illinois examined 174, of whom 47.1% failed, California examined 96, with 41.7% failures, and Ohio examined 80, with 42.5% failures. Other states examined fewer than 33.

Table 32 presents the number of graduates of faculties of medicine abroad examined for medical licensure in the United States in 22 years (1930-1951). In 1936 the number of foreign-trained physicians began to increase, and by 1940 there were over three times as many as were tested in 1936. Beginning in 1944 the numbers examined began to decrease, until 1949 when there was a noticeable increase. In 1951 there were 207 more examined than in the preceding year. At no time in the 22 year period did fewer than 30.7% fail in a given year.

Represented in table 33 are figures regarding the foreign-trained physicians registered in 1951 who were not previously licensed in the United States and who

TABLE 32.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1930-1951*

Year	Number Examined	Passed	Percentage Failed
1930	167	92	44.9
1931	158	91	42.4
1932	182	96	47.3
1933	200	129	35.5
1934	285	170	40.2
1935	437	303	30.7
1936	588	382	35.0
1937	920	637	30.8
1938	1,164	716	38.5
1939	1,691	839	50.4
1940	2,088	948	54.7
1941	1,717	698	59.2
1942	1,630	890	45.4
1943	1,031	518	49.8
1944	691	325	53.0
1945	475	209	56.0
1946	495	221	55.3
1947	601	283	52.9
1948	639	311	51.3
1949	737	319	56.7
1950	799	359	55.0
1951	1,006	524	47.9
Totals	17,701	9,060	43.1

TABLE 33.—*Graduates of Foreign Medical Faculties Representing Additions to the Medical Profession, 1951*

	Examination	Reciprocity or Endosement	Total
Arizona	1	0	1
California	55	0	55
Colorado	1	0	1
Connecticut	2	0	2
District of Columbia	6	3	9
Florida	3	0	3
Illinois	83	0	83
Maryland	6	0	6
Massachusetts	3	2	5
Michigan	1	0	1
Minnesota	6	0	6
Missouri	5	0	5
New Hampshire	0	2	2
New Jersey	6	0	6
New York	181	14	195
North Carolina	1	0	1
North Dakota	7	0	7
Ohio	36	1	37
Rhode Island	4	0	4
South Dakota	1	0	1
Texas	4	1	5
Virginia	8	0	8
Wisconsin	2	0	2
Hawaii	1	0	1
Guam	0	2	2
Virgin Islands	2	0	2
Totals	425	25	450

TABLE 34.—*Additions to the Medical Profession Representing Graduates of Foreign Medical Faculties, 1950-1951*

	Examination	Reciprocity or Endorsement	Totals
1950	267	41	308
1951	425	25	450
Totals	692	66	758

therefore are additions to the medical profession. There were 450 in this group, of whom 425 were licensed by written examination and 25 by endorsement of credentials. Comparative figures for 1950, the first year in which computations were made regarding foreign-trained physicians representing additions to the medical profession, are included in table 34. In this year 308 were new additions to the physician population in the United States. In the two year period, 758 physicians are represented by this group.

CORRESPONDING OFFICERS OF STATE BOARDS OF MEDICAL EXAMINERS

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Minnesota	Dr. J. F. DuBois, Secretary, 230 Lowry Medical Arts Bldg., St. Paul 2
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Montana	Dr. Sidney A. Cooney, Secretary, 7 W. 6th Ave., Helena
Nebraska	Mr. Husted K. Watson, Director, Room 1009, State Capitol Bldg., Lincoln 9
Nevada	Dr. G. H. Ross, Secretary, 112 North Curry St., Carson City
New Hampshire	Dr. John S. Wheeler, Secretary, 107 State House, Concord
New Jersey	Dr. E. S. Hallinger, Secretary, 28 West State St., Trenton
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New York	Dr. Stiles D. Ezell, Secretary, 23 S. Pearl St., Albany 7
North Carolina	Dr. Joseph J. Combs, Secretary, 419 Professional Bldg., Raleigh
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Oklahoma	Dr. Clinton Gallaher, Secretary, 813 Braniff Bldg., Oklahoma City
Oregon	Mr. Howard I. Bobbitt, Executive Secretary, 609 Failing Bldg., Portland
Pennsylvania	Mrs. M. G. Steiner, Acting Secretary, 351 Education Bldg., Harrisburg
Rhode Island	Mr. Thomas B. Casey, Administrator, 366 State Office Bldg., Providence
South Carolina	Dr. N. B. Heyward, Secretary, 1329 Blanding St., Columbia
South Dakota	Mr. John C. Foster, Executive Secretary, 300 1st National Bank Bldg., Sioux Falls
Tennessee	Dr. H. W. Qualls, Secretary, 1635 Exchange Bldg., Memphis 3
Texas	Dr. M. H. Crabb, Secretary, 1714 Medical Arts Bldg., Ft. Worth 2
Utah	Mr. Frank E. Lees, Assistant Director, 314 State Capitol Building, Salt Lake City 1
Vermont	Dr. F. J. Lawliss, Secretary, Richford
Virginia	Dr. K. D. Graves, Secretary, 631 First St., S.W., Roanoke
Washington	Mr. J. D. McDougall, Acting Director, Olympia
West Virginia	Dr. N. H. Dyer, Secretary, State Office Bldg. No. 3, Charleston 5
Wisconsin	Dr. A. G. Koehler, Secretary, 46 Washington Blvd., Oshkosh
Wyoming	Dr. Franklin D. Yoder, Secretary, Capitol Bldg., Cheyenne
Alaska	Dr. W. M. Whitehead, Secretary, Box 140, Juneau
Canal Zone	Dr. S. D. Avery, Chief Health Officer, Balboa Heights
Guam	Dr. Austin W. Matthis, Executive Secretary, Agana
Hawaii	Dr. I. L. Tilden, Secretary, 1020 Kapiolani St., Honolulu
Puerto Rico	Mr. Luis Cueto Coll, Secretary, Box 9156, Santurce
Virgin Islands	Dr. Earle M. Rice, Secretary, St. Thomas

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Nineteen states, the District of Columbia, and Alaska have adopted by legislative action basic science requirements underlying the practice of the healing art. A basic science law provides for the establishment of a board of examiners and requires that each person who desires to practice the healing arts appear before the board and demonstrate his knowledge of the basic sciences. The basic science boards have no licensing powers. A certificate in the basic sciences is a prerequisite to licensure in these states.

The boards comprising this group, together with the year of enactment of the basic science law, are recorded in table 35. Nevada was added to this group in 1951.

The subjects in which examinations are conducted are shown in table 36. These subjects are specified by statute. The examining boards have no authority to add any subjects or to refrain from examining in any subjects, although in some states provision is made for certification without examination, by waiver or exemption. The credentials acceptable for certification without examination are listed in table 37.

The results of examinations given and the number of certificates issued on the basis of reciprocity, endorsement, waiver, or exemption during 1951 are presented in tables 38 and 39. A candidate in applying for a basic science certificate is not required by law to reveal his school of practice. The lists submitted by the respective boards, however, have been checked with the biographic records of physicians and medical students maintained by the American Medical Association and with various directories. In this way it has been possible to determine the profession of the majority of candidates. By this means, the data presented have been tabulated in four groups, namely, physicians and medical students, osteo-

paths, chiropractors and naturopaths, and unclassified applicants. The last category includes those for whom it was not possible to determine the profession represented. In Rhode Island doctors of dentistry are included in this latter group. It is probable that many in this unclassified group include osteopaths, chiropractors, and also naturopaths who have not been identified by the reference data available.

There were 3,198 candidates examined by the 21 boards in operation in 1951. The numbers examined in the four categories mentioned and the total examined by each board are shown in table 38. The majority (2,810) represented physicians or medical students, 241 were osteopaths, 214 chiropractors or naturopaths, and 668 were placed in the unclassified group. Of all applicants, 39.8% failed. Of the physicians and medical students 11.3% failed, of osteopaths 19%, of chiropractors and naturopaths 62.1%, and of unclassified 35.3%. Among those who were certified, there were 2,491 physicians and medical students, 194 osteopaths, 81 chiropractors or naturopaths, and 432 unclassified candidates. The basic science boards of Iowa, Florida, and Minnesota examined the greatest number of applicants. Iowa examined 1,348, Florida 839, and Minnesota 742. The percentage of failures in these states was 70.6, 26.7, and 56.8 respectively. Alaska had no failures, while the District of Columbia had 4.2% failures. Both of these boards examined only physicians or medical students in 1951.

TABLE 35.—*States Having Basic Science Laws and Year of Enactment*

Alaska	1946	Nevada	1951
Arizona	1936	New Mexico	1941
Arkansas	1929	Oklahoma	1937
Colorado	1937	Oregon	1934
Connecticut	1925	Rhode Island	1940
District of Columbia	1929	South Dakota	1939
Florida	1939	Tennessee	1943
Iowa	1936	Texas	1949
Michigan	1937	Washington	1927
Minnesota	1927	Wisconsin	1925
Nebraska	1927		

TABLE 36.—*Subjects Included in Basic Science Examinations*

	Examinations Required in							
	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology	Public Health
Alaska	x	x	x	..	x	x	x	..
Arizona	x	x	x	..	x	x	x	..
Arkansas	x	x	x	..	x	x	x	..
Colorado	x	x	x	..	..	x	x	..
Connecticut	x	..	..	x	x	x	x	..
Dist. Columbia	x	x	x	..	..	x	x	..
Florida	x	x	x	..	..	x	x	..
Iowa	x	x	x	..	x	x	x	..
Michigan	x	x	x	..	x	x	x	x
Minnesota	x	x	x	..	x	x	x	..
Nebraska	x	x	x	..	x	x	x	..
Nevada	x	x	x	..	..	x	x	..
New Mexico	x	x	x	..	..	x	x	..
Oklahoma	x	x	x	..	..	x	x	..
Oregon	x	..	x	..	x	x	x	..
Rhode Island	x	x	x	..	..	x	x	..
South Dakota	x	x	x	..	..	x	x	..
Tennessee	x	x	x	..	..	x	x	..
Texas	x	x	x	..	x	x	x	x
Washington	x	..	x	..	x	x	x	..
Wisconsin	x	..	..	x	..	x	x	..

TABLE 37.—*Reciprocity, Endorsement, Waiver or Exemption Policies of Basic Science Boards*

	Credentials Accepted
Alaska	Physicians are accepted on reciprocity from the following state medical and/or basic science boards: Alabama, Arkansas, California, Colorado, Connecticut, District of Columbia, Indiana, Kansas, Kentucky, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New Jersey, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin.
Arizona	Those who present basic science certificate earned by examination before basic science board of any other state given credit for examinations taken before that board. Those licensed in some other basic science state before the basic science law of that state was adopted if such are covered by a grandfather previous licensure clause in that other state.
Arkansas	Certificate of basic science boards of all states except Florida, Iowa and New Mexico.
Colorado	(*a*) Certificates obtained by examination from the following basic science boards: Arizona, Arkansas, District of Columbia, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee and Texas. (*b*) Applicants who present basic science certificates from the Connecticut and Wisconsin boards are examined in chemistry and bacteriology. (*c*) Complete reciprocity with the Iowa Basic Science Board is granted to those whose original application was received on or before June 1, 1949. Others must pass four of the five subjects given by the Colorado Board. (*d*) Reciprocity is granted with Alaska to those candidates who have passed, at one sitting, four out of five subjects given by the Colorado board.
Connecticut	No reciprocity. Board may in its discretion waive examination.
District of Columbia	Board may exempt an applicant and accept in lieu of examination proof that the applicant has passed before a basic science or licensing board an examination in subjects required by District of Columbia basic science board. Diplomates of the National Board of Medical Examiners may also be exempt from examination.
Florida	None.
Iowa	Certificate by exemption granted if credentials presented are equal to those of Iowa basic science board.
Michigan	Certificates from Arkansas, Minnesota and Nebraska basic science boards.
Minnesota	(*a*) Certificate of basic science boards of Arizona, Arkansas, Colorado, Michigan, Nebraska, Oklahoma, Oregon, South Dakota, Tennessee and Texas. (*b*) Applicants from Alabama, Georgia, Louisiana and the District of Columbia granted partial credit. (*c*) Medical Boards of Arizona, Indiana, Kentucky, Michigan, Missouri, New York, Oklahoma, Texas, Vermont and Virginia. (*d*) Part I of the examination of the National Board of Medical Examiners.
Nebraska	In the case of states having a basic science law, waiver is based on the results of the basic science examination. Or waiver may be made on the basis of grades obtained before a medical board, if basic science certificate is not held by the applicant. A grade of at least 75 per cent is necessary in each of the basic science subjects in which applicants are examined in Nebraska.
Nevada	Certificate of Arizona, Colorado, Iowa, Minnesota, South Dakota, Tennessee and Texas accepted. The same subjects as Nevada and a grade of 75 per cent in each subject are required for reciprocity or waiver.
New Mexico	Reciprocity with Arizona, Colorado, Oregon and Tennessee and a limited reciprocity with Wisconsin.
Oklahoma	No signed agreements. Candidates are accepted or rejected on the basis of individual qualifications.
Oregon	Certificate in the basic sciences obtained by examination in Arkansas, Colorado, Iowa, Minnesota, Nebraska, New Mexico, Oklahoma, South Dakota, Tennessee, Texas and Wisconsin.
Rhode Island	Endorsement with Massachusetts Board of Registration in Medicine after oral examination.
South Dakota	Certificate of basic science boards, Arizona, Arkansas, Colorado, Iowa, Minnesota, Nebraska, Nevada, Oklahoma, Oregon, Tennessee, Texas and Wisconsin.
Tennessee	(*a*) Certificate of basic science boards of Arizona, Arkansas, Colorado, District of Columbia, Minnesota, Nebraska, New Mexico, Oklahoma, Oregon, South Dakota, Texas, Virginia and Wisconsin. (*b*) Granting of a certificate by waiver by accepting grades in required subjects earned by examination before a medical examining board or the National Board of Medical Examiners is handled on an individual basis.
Texas	Certificate of basic science boards of Arizona, Arkansas, Colorado, Iowa, Minnesota, Nebraska, Oklahoma, Oregon, South Dakota and Tennessee and partial reciprocity with Wisconsin.
Washington	None.
Wisconsin	(*a*) Certificate of all basic science boards. (*b*) Accepts certification on the basis of examination from any legally established medical board. (*c*) Accepts examinations of the Medical Council of Canada.

TABLE 38.—*Applicants Examined in Basic Sciences, 1951*

	Physicians and Medical Students		Osteopaths		Chiropractors and Naturopaths		Unclassified and Others		Total Examined	Passed	Failed	Percentage Failed
	P	F	P	F	P	F	P	F				
Alaska	3	0	0	0	0	0	0	0	3	3	0	0.0
Arizona	34	..	3	..	0	..	10	..	56	47	9*	16.1
Arkansas	84	1	22	11	8	6	2	22	156	116	40	25.6
Colorado	141	0	1	0	1	0	10	9	162	153	9	5.6
Connecticut	104	9	1	0	2	23	0	0	139	107	32	23.0
District of Columbia	23	1	0	0	0	0	0	0	24	23	1	4.2
Florida	445	101	33	16	15	8	122	99	889	615	224	26.7
Iowa	152	..	72	..	30	..	141	..	1,348	395	953*	70.6
Michigan	368	60	3	3	1	4	37	26	502	409	93	18.5
Minnesota	208	..	45	..	3	..	64	..	742	320	422*	56.8
Nebraska	88	26	0	1	0	2	7	5	129	95	34	26.4
Nevada	4	2	0	0	0	0	0	0	6	4	2	33.3
New Mexico	33	2	1	1	0	0	5	0	42	39	3	7.0
Oklahoma	77	3	0	0	0	2	0	3	85	77	8	9.4
Oregon	102	36	1	4	3	0	4	28	178	110	68	38.2
Rhode Island**	65	11	1	0	1	0	10	3	91	77	14	15.4
South Dakota	43	7	2	0	0	0	19	25	96	64	32	33.3
Tennessee	188	22	0	0	0	0	1	14	225	189	36	16.0
Texas	82	22	0	1	0	1	0	2	108	82	26	24.1
Washington	66	7	4	2	0	7	0	0	86	70	16	18.6
Wisconsin	181	9	5	8	17	80	0	0	300	208	97	32.3
Totals—Examined	2,810		241		214		668		5,317			
Totals—Passed	2,491		194		81		432			3,198		
Totals—Failed	319		47		133		236				2,119	
Percentage—Failed	11.3		19.0		62.1		35.3					39.8

* Nature of practice undeterminable since names of failures not supplied.
** Figures in unclassified column refer to doctors of dentistry.

TABLE 39.—*Basic Science Certificates Issued by Examination, Reciprocity and Endorsement, 1951*

	Examination					Reciprocity, Endorsement, Exemption or Waiver					
	Physicians and Medical Students	Osteopaths	Chiropractors and Naturopaths	Unclassified and Others	Totals	Physicians and Medical Students	Osteopaths	Chiropractors	Unclassified and Others	Totals	Registered
Alaska	3	0	0	0	3	9	0	3	0	12	15
Arizona	34	3	0	10	47	55	33	4	27	119	166
Arkansas	84	22	8	2	116	48	0	1	0	49	165
Colorado	141	1	1	10	153	41	10	10	8	69	222
Connecticut	104	1	2	0	107	0	0	0	0	0	107
District of Columbia	23	0	0	0	23	81	0	0	0	81	104
Florida	445	33	15	122	615	0	0	0	0	0	615
Iowa	152	72	30	141	395	131	8	11	66	216	611
Michigan	368	3	1	37	409	22	48	9	32	111	520
Minnesota	208	45	3	64	320	139	0	2	0	141	461
Nebraska	88	0	0	7	95	34	0	0	0	34	129
Nevada	4	0	0	0	4	7	0	0	0	7	11
New Mexico	33	1	0	5	39	0	0	0	0	0	39
Oklahoma	77	0	0	0	77	1	0	1	0	2	79
Oregon	102	1	3	4	110	50	6	4	22	82	192
Rhode Island*	65	1	1	10	77	4	0	0	0	4	81
South Dakota	43	2	0	19	64	30	1	4	11	46	110
Tennessee	188	0	0	1	189	99	4	4	2	109	298
Texas	82	0	0	0	82	602	62	25	18	707	789
Washington	66	4	0	0	70	0	0	0	0	0	70
Wisconsin	181	5	17	0	203	100	11	39	0	150	353
Totals	2,491	194	81	432	3,198	1,453	183	117	186	1,939	5,137

* Figures in unclassified column refer to doctors of dentistry.

Arizona, Iowa, and Minnesota do not report the names of applicants who fail examinations. The numbers who fail are, therefore, recorded only in the total column.

Physicians or medical students were examined by all boards, osteopaths by 16 boards, chiropractors by 14 boards, naturopaths by the Connecticut board, dentists by the Rhode Island board, while figures for 15 boards are included in the unclassified group.

TABLE 40.—*Total Candidates for Basic Science Certification, 1927-1951*

		Physicians and Medical Students					Other Practitioners					
	No. of Boards	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified
1927	5	305	279	26	8.5	26	305	22	15	7	31.8	1	16
1928	5	646	586	60	9.3	19	605	59	31	28	47.5	0	31
1929	7	668	610	58	8.7	75	685	66	31	35	53.0	0	31
1930	7	685	606	79	11.5	118	724	78	30	48	61.5	4	34
1931	7	689	586	94	13.8	141	727	107	48	59	55.1	0	48
1932	7	657	590	67	10.2	106	696	78	44	34	43.6	12	56
1933	8	601	527	74	12.3	121	648	60	30	30	50.0	10	40
1934	9	815	725	90	11.0	127	852	51	26	25	49.0	11	37
1935	10	882	761	121	13.7	110	871	74	33	41	55.4	4	37
1936	10	1,032	891	141	13.7	230	1,121	66	26	40	60.6	13	39
1937	12	1,231	1,061	170	13.8	192	1,253	113	41	72	63.7	10	51
1938	12	1,168	1,026	142	12.2	267	1,293	158	70	88	55.7	26	96
1939	14	1,141	1,013	128	11.2	727	1,740	218	97	121	55.5	294	391
1940	16	1,303	1,140	163	12.5	324	1,464	280	153	127	43.9	22	175
1941	17	1,768	1,560	208	11.8	280	1,840	356	191	165	46.3	73	264
1942	17	1,725	1,476	249	14.4	213	1,689	497	249	248	49.9	91	340
1943	18	2,330	2,098	232	10.0	296	2,394	389	211	178	45.8	86	297
1944	18	2,284	1,868	416	18.2	222	2,090	465	276	189	40.6	87	363
1945	18	2,576	2,146	430	16.6	412	2,558	397	193	204	51.4	172	365
1946	19	2,937	2,391	546	18.7	1,308	3,699	313	167	146	46.6	166	333
1947	19	3,132	2,405	727	23.2	771	3,176	406	228	178	43.8	189	417
1948	19	3,000	2,601	399	13.3	1,069	3,670	827	437	390	47.1	349	786
1949	20	2,932	2,540	392	13.4	940	3,480	2,239	1,116	1,123	50.2	540	1,656
1950	20	2,989	2,627	362	12.1	2,176	4,803	1,781	803	978	54.8	350	1,153
1951	21	2,810	2,491	319	11.3	1,453	3,844	1,123	707	416	37.0	486	1,193
Totals		40,297	34,604	5,693	14.1	11,723	46,255	10,223	5,253	4,970	48.6	3,996	9,249

TABLE 41.—*Basic Science Fees*

Alaska	$25	Nevada	$25
Arizona	20	New Mexico	25
Arkansas	10 [1]	Oklahoma	15 [4]
Colorado	25	Oregon	10
Connecticut	10	Rhode Island	10
District of Columbia	25	South Dakota	15 [2]
Florida	10	Tennessee	10 [5]
Iowa	10	Texas	15 [3]
Michigan	10 [6]	Washington	10
Minnesota	15 [2]	Wisconsin	10 [6]
Nebraska	10 [5]		

1. Reciprocity, $5.
2. Reciprocity, $25.
3. Waiver, $15.
4. Reciprocity, $50.
5. Reciprocity, $5.
6. Reciprocity, $15.

Seventeen boards issued 1,939 certificates by reciprocity, endorsement, waiver, or exemption. The number of successful applicants by examination and by endorsement (5,137) is recorded in table 39. Included in the total certified were 3,844 physicians or medical students and 1,193 others representing osteopaths, chiropractors, naturopaths, and the unclassified group. This latter group included 377 osteopaths, 198 chiropractors, and 618 unclassified candidates.

In 25 years, 40,297 (table 40) physicians and medical students were examined, of whom 34,604 were successful in their examinations. In the same period 5,253

other practitioners were tested and 4,970 were successful. There were 11,723 physicians and medical students issued certificates without examination and 3,996 to other practitioners. In both categories during the 25 year period there were 46,255 certificates issued to physicians and medical students and 9,249 to other practitioners.

The principle of basic science legislation is to provide a means of insuring that all who seek licensure to care for sick and injured persons shall first possess a reasonable knowledge of the sciences fundamental to the healing art. The endorsement of such laws affects mostly the group classified as "other practitioners." This is particularly significant, since the testing is made by nonmedical examiners.

The present executive corresponding officer of each of the 21 basic science boards is as follows:

Arizona	Mr. Francis A. Roy, Secretary, Liberal Arts Bldg., Room 423, University of Arizona, Tucson
Arkansas	Mr. L. E. Gebauer, Secretary, 1002 Donaghey Bldg., Little Rock
Colorado	Dr. Esther B. Starks, Secretary, 1459 Ogden Street, Denver
Connecticut	Mr. M. G. Reynolds, Executive Assistant, 110 Whitney Avenue, New Haven 10
District of Columbia	Dr. Daniel L. Seckinger, Secretary, 4130 E. Municipal Bldg., Washington
Florida	Mr. M. W. Emmel, Secretary, University of Florida, Box 340, Gainesville
Iowa	Dr. Ben H. Peterson, Secretary, Coe College, Cedar Rapids
Michigan	Mrs. Anne Baker, Secretary, 423 W. Michigan Avenue, Lansing
Minnesota	Dr. Raymond N. Bieter, Secretary, 105 Millard Hall, University of Minnesota, Minneapolis 14
Nebraska	Mr. Husted K. Watson, Director, Room 1009, State Capitol Bldg., Lincoln 9
Nevada	Mr. Frank Richardson, Secretary, University of Nevada, Reno
New Mexico	Mrs. Marguerite Cantrell, Secretary, P. O. Box 1592, Santa Fe
Oklahoma	Dr. Clinton Gallaher, Secretary, 813 Braniff Bldg., Oklahoma City
Oregon	Dr. C. D. Byrne, Secretary, University of Oregon, Eugene
Rhode Island	Mr. Thomas B. Casey, Administrator, 366 State Office Bldg., Providence
South Dakota	Dr. G. M. Evans, Secretary, 310 East 15th Street, Yankton
Tennessee	Dr. O. W. Hyman, Secretary, 874 Union Avenue, Memphis.
Texas	Bro. Raphael Wilson, Secretary, 407 Perry-Brooks Bldg., Austin
Washington	Mr. J. D. McDougall, Acting Director, Olympia
Wisconsin	Mr. W. H. Barber, Secretary, 621 Ransom Street, Ripon
Alaska	Dr. C. Earl Albrecht, Secretary, Box 1931, Juneau

NATIONAL BOARD OF MEDICAL EXAMINERS

The medical licensing boards of 46 states, the District of Columbia, the territories of Alaska, Hawaii, and Puerto Rico, and the Canal Zone, recognize the certificate of the National Board of Medical Examiners as an adequate qualification for a medical license. Montana was added to this group in 1951. The Medical Practice Act of Wisconsin was amended in 1951 and provides that in lieu of its own examination, the board of medical examiners may accept, either in whole or in part, the certificate of the National Board. The certificate is not recognized by the licensing boards of Florida and Texas. While the National Board reports Texas as one of the states which does not accept its certificate, three physicians were reported as licensed by endorsement of the certificate in 1951.

Delaware requires that the National Board diplomates have two years of medical practice to qualify for licensure. Louisiana exempts diplomates from the state examination if they have been licensed in some other state with which Louisiana reciprocates. The laws or regulations of the licensing boards in Hawaii, Illinois, Rhode Island, and Wyoming require diplomates of the National Board to take an oral examination. A brief supplemental written examination is required in Maine and in Michigan. The states, territories, and possessions which will endorse the National Board certificate are recorded in table 42.

In addition to the boards of medical licensure, 19 states, the District of Columbia, and Alaska have established separate examining boards in the basic sciences. The laws of nine of these boards are sufficiently broad to

TABLE 42.—*Licensing Boards Endorsing the Certificate of the National Board of Medical Examiners, 1952*

Alabama	Illinois [1]	Montana	Pennsylvania
Alaska [3]	Indiana	Nebraska [3]	Puerto Rico
Arizona	Iowa [3]	Nevada	Rhode Island [1]
Arkansas [3]	Kansas	New Hampshire	South Carolina
California	Kentucky	New Jersey	South Dakota
Canal Zone	Louisiana [4]	New Mexico	Tennessee [3]
Colorado	Maine [2]	New York	Utah
Connecticut [3]	Maryland	North Carolina	Vermont
Delaware	Massachusetts	North Dakota	Virginia
Dist. of Columbia [3]	Michigan [2]	Ohio	Washington
Georgia	Minnesota [3]	Oklahoma	West Virginia
Hawaii [1]	Mississippi	Oregon	Wyoming [1]
Idaho	Missouri		

1. Oral examination required.
2. Brief supplemental written examination required.
3. Examination in basic sciences accepted by state basic science board.
4. Licensure in a state with which Louisiana reciprocates required.

Some states exact additional requirements, i. e., a basic science certificate, proof of citizenship and an internship of one year. These are general requirements of all candidates for licensure.

TABLE 43.—*National Board Examinations, 1916-1921*

Year	Total Examined	Passed	Failed	Percentage Failed
1916	10	5	5	50.0
1917	40	31	9	22.5
1918	59	51	8	13.8
1919	52	51	1	1.9
1920	108	82	26	24.0
1921	56	48	8	14.2
Totals	325*	268	57	17.5

* Represents eleven examinations.

enable them to accept the examinations of the National Board in lieu of their own. These include the boards of Alaska, Arkansas, Connecticut, Iowa, Minnesota, Oklahoma, Tennessee, and the District of Columbia. The Nebraska board accepts the National Board's examinations in most instances after reviewing the answer papers.

The board's examinations are also accepted by many medical schools as part of their own examination and promotion procedures, and other schools recommend that they be taken. Some schools require students to pass part 1 at the end of the second academic year and part 2 at the end of the fourth year. Other schools require only that part 2 be passed by the end of the fourth year. There are a few schools at which those students who voluntarily take and pass the board's examinations either in part 1 or 2 are excused from the corresponding final school examinations.

The National Board admits to its examination those students who are enrolled in or who have graduated from (*a*) medical schools in the United States and Canada approved by the Council on Medical Education and Hospitals of the American Medical Association, (*b*) the university medical schools of Great Britain and Ireland, and (*c*) foreign medical schools considered acceptable by the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges.

TABLE 44.—*National Board Examinations in Part 1, 1922-1951*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February 1951	394	332	34	28	7.1
June 1951	2,255	1,271	774	210	9.3
September 1951	871	550	230	91	10.5
Totals	3,520	2,153	1,038	329	9.3
1922	388	263	58	67	20.3
1923	507	349	77	81	18.8
1924	591	415	69	107	20.5
1925	608	400	50	158	28.3
1926	625	436	104	85	16.3
1927	702	452	159	91	16.8
1928	843	533	231	79	12.9
1929	1,096	675	331	90	11.8
1930	1,260	801	345	114	12.5
1931	1,277	755	425	97	11.4
1932	1,307	847	371	89	9.5
1933	1,234	782	316	136	14.8
1934	1,241	809	347	85	9.5
1935	1,264	785	410	69	8.1
1936	1,344	858	363	123	12.5
1937	1,435	871	415	149	14.6
1938	1,654	986	508	160	14.0
1939	1,733	1,048	460	225	17.7
1940	1,653	1,069	375	209	16.4
1941	1,640	1,087	346	207	16.0
1942	1,867	1,204	471	192	13.8
1943	2,656	1,441	962	253	14.9
1944	4,229	2,326	1,465	438	15.9
1945	3,865	2,106	1,475	284	11.8
1946	3,148	1,695	1,189	264	13.5
1947	3,514	1,844	1,352	318	14.7
1948	3,807	2,178	1,262	367	14.4
1949	3,823	2,337	1,243	243	9.4
1950	3,678	2,358	986	334	9.0
1951	3,520	2,153	1,038	329	9.3
Totals	56,509	33,863	17,203	5,443	9.6

Data regarding the examinations conducted and the issuance of certificates by the National Board are presented for the 30th consecutive year.

TABLE 45.—*National Board Examinations in Part 2, 1922-1951*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February 1951	222	216	0	6	2.7
April 1951	1,360	1,349	0	11	0.8
June 1951	453	452	0	1	0.2
Totals	2,045	2,017	0	18	1.4
1922	109	90	0	19	17.4
1923	192	170	2	20	10.5
1924	267	227	0	40	15.0
1925	342	309	0	33	9.6
1926	381	334	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	465	399	19	47	10.5
1930	620	543	7	70	11.4
1931	719	630	2	87	12.1
1932	732	674	0	58	7.9
1933	714	651	0	63	8.8
1934	633	583	0	50	7.9
1935	689	620	0	69	10.0
1936	768	716	2	50	6.5
1937	855	803	1	51	6.0
1938	861	815	0	46	5.3
1939	938	884	0	54	5.8
1940	1,028	963	9	56	5.5
1941	1,001	954	1	46	4.6
1942	1,072	1,031	0	41	3.8
1943	1,861	1,805	0	56	3.0
1944	1,405	1,350	0	55	3.9
1945	1,599	1,565	0	34	2.1
1946	1,825	1,782	0	43	2.4
1947	1,641	1,613	0	28	1.7
1948	1,742	1,725	0	17	0.9
1949	1,737	1,691	0	46	2.6
1950	1,863	1,837	0	26	1.3
1951	2,045	2,017	0	28	1.4
Totals	28,875	27,466	46	1,363	4.7

The National Board of Medical Examiners was founded in 1915 by Dr. W. L. Rodman, then President of the American Medical Association. The first examination for certification was given in October, 1916. From that date up to and including a test given in June, 1921, a total of 11 examinations were given and 268 candidates were certified. The numbers examined during this period are recorded in annual figures in table 43.

Since 1922 the examination has been divided into three parts, which must be taken and completed in the following sequence: part 1, a written examination in six basic science subjects; part 2, a written examination in six major clinical divisions and their component subjects or subdivisions, and part 3, an oral and practical evaluation of the candidate's ability in critical observation, in diagnostic acumen, and in the principles of therapy. The examination in part 3 is divided in four periods, allocated to the following four major elements of general practice: clinical medicine, pediatrics, clinical surgery, and obstetrics.

Examinations in parts 1 and 2 are held in the winter and late spring at medical schools in the United States and Canada. An additional examination in part 1 is held in September. These examinations are held at those medical schools that can conveniently accommodate them, if five or more candidates have registered. The examinations in part 3 are given under the direction of local subsidiary boards in 29 centers at times that are announced well in advance of the date of the examination. The dates of all examinations are posted on college bulletin boards and published in THE JOURNAL and in *The Diplomate*.

The tables that are hereinafter presented refer to the results of examinations in parts 1, 2, and 3 for each calendar year since 1922, including those who passed and failed examinations and those certified as well as other pertinent data.

A candidate is eligible for part 1 who has completed successfully the first two years of work in an approved medical school. Candidates are required to take all six basic science subjects of part 1 at one examination period unless entitled to take an incomplete examination. An incomplete examination is allowed candidates taking part 1 at the end of their second medical year in schools whose third year curricula include courses in one or two subjects of this part. The examinations in the subjects not yet completed are postponed and may be taken at any examination period after the candidate has completed them in his medical school. They are recorded in these tabulations under the heading "Incomplete Examinations" and are excluded from the calculations referring to the percentage of failures.

A candidate is eligible for part 2 who has passed part 1 and has completed successfully a four year medical course.

TABLE 46.—*National Board Examinations in Part 3, 1922-1951*

Year	Total Examinations	Passed	Failed	Percentage Failed
1922	22	22	0	0.0
1923	82	81	1	1.2
1924	126	120	6	4.8
1925	219	206	13	5.9
1926	255	243	12	4.7
1927	293	272	21	7.2
1928	322	306	16	5.0
1929	352	337	15	4.3
1930	420	401	19	4.5
1931	437	419	18	4.1
1932	550	522	28	5.1
1933	551	526	25	4.5
1934	567	548	19	3.4
1935	598	578	20	3.3
1936	576	547	29	5.0
1937	668	630	38	5.7
1938	706	682	24	3.4
1939	770	729	41	5.3
1940	792	771	21	2.7
1941	910	885	25	2.7
1942	1,054	1,041	13	1.2
1943	1,230	1,213	17	1.4
1944	1,168	1,146	22	1.8
1945	1,245	1,232	13	1.0
1946	1,634	1,613	21	1.2
1947	1,741	1,723	18	1.0
1948	1,715	1,700	15	0.9
1949	1,685	1,674	11	0.6
1950	1,752	1,736	16	0.9
1951	1,738	1,708	30	1.7
Totals	24,178	23,611	567	2.3

TABLE 47.—*Diplomates from Individual Medical Schools, 1951*

United States		Duke University	55
Medical College of Alabama	6	Bowman Gray School of Med.	1
College of Medical Evangelists	35	University of Cincinnati	1
Univer. of Southern California	3	Western Reserve University	5
Stanford University	6	Ohio State University	11
University of Colorado	3	University of Oregon	5
Yale University	43	Hahnemann Medical College	74
Georgetown University	77	Jefferson Medical College	22
George Washington University	74	Temple University	47
Howard University	10	University of Pennsylvania	25
Emory University	8	Woman's Medical College	26
Chicago Medical School	4	University of Pittsburgh	5
Northwestern University	23	Medical College of S. C.	1
Stritch School of Medicine	8	Meharry Medical College	2
University of Chicago	29	Vanderbilt University	2
University of Illinois	31	Baylor University	8
Indiana University	3	University of Utah	2
State University of Iowa	11	University of Vermont	16
University of Kansas	1	University of Virginia	7
University of Louisville	6	Medical College of Virginia	2
Tulane University	10	University of Wisconsin	2
Johns Hopkins University	15	Marquette University	7
University of Maryland	4	**Canada**	
Boston University	52	Dalhousie University	4
Harvard Medical School	103	Queen's University	2
Tufts College Medical School	92	University of Western Ontario	4
University of Michigan	12	University of Toronto	8
University of Minnesota	4	McGill University	21
St. Louis University	11	University of Montreal	3
Washington University	12	**Foreign**	
Creighton University	11	Cheeloo University	1
University of Nebraska	6	University of Birmingham	1
Albany Medical College	51	University of Cambridge	1
State University of New York, New York City	96	University of London	1
University of Buffalo	66	St. Bartholomew's Hospital Medical College	1
Columbia University	90	Trinity College	1
Cornell University	39	University of Rome	1
New York Medical College	93	University of Edinburgh	1
New York University	103	University of Glasgow	2
University of Rochester	44	University of Lausanne	1
State Univ. of N. Y., Syracuse	39		

A candidate is eligible for part 3 if he has (*a*) passed parts 1 and 2, (*b*) received the degree of Doctor of Medicine, and (*c*) served at least one year as an intern in a hospital approved by the American Medical Association or by the Canadian Medical Association. Under special circumstances, consideration may be given to service in a laboratory, the nature of which is acceptable to the National Board as the equivalent of hospital service.

Tables 44 and 45 record the results of examinations given in parts 1 and 2 during 1951 and for each year since 1922. The data shown represent examinations conducted rather than persons examined. The tabular data include candidates who fail and are reexamined during the same year and those who pass parts 1 and 2 in the same year.

In 1951, 3,520 examinations were given in part 1; 2,153 passed, and 329, or 9.3%, failed. There were 1,038 incomplete examinations given. In part 2, 2,045 examinations were held; 2,017 passed, and 18, or 1.4%, failed. Incomplete examinations are seldom given in this part. There were none in 1951.

Since 1922 a total of 56,509 examinations have been given in part 1 and 28,875 in part 2. During this period 33,863 passed part 1 and 27,466 passed part 2. In the 30 year period shown, there have been 5,443 failures in part 1 (9.6%), and 1,363 (4.7%) in part 2. The increasing recognition of the National Board's examinations is reflected in the figures presented in these two tables, particularly since 1943. The greatest number of examinations was given in part 1 in 1944, when medical schools were operating on an accelerated program. In 1951 the numbers examined in part 2 exceeded all previous years.

In 1951, 1,738 tests were given in part 3; 1,708 passed, and 30 (1.7%) failed. Results of examinations in part 3 in 1951 and in the 29 preceding years are given in table 46. In 30 years, 24,178 were tested, of whom 23,611 were granted the certificate of the board. The percentage of failures in this final examination in 30 years was 2.3.

The 1,708 physicians certified as diplomates in 1951 represented 62 medical schools in the United States, 6 in Canada, and 10 medical schools of other countries. The school and the number of examinees from each are included in table 47.

TABLE 48.—*Parts 1, 2 and 3, Excluding Duplications, 1922-1951*

Year	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
1922	525	381	58	86	18.4
1923	775	594	79	102	14.7
1924	978	756	69	153	16.8
1925	1,167	915	50	202	18.1
1926	1,161	930	105	126	11.9
1927	1,248	947	142	159	14.4
1928	1,430	1,101	211	118	9.7
1929	1,723	1,280	319	124	8.8
1930	2,044	1,547	322	175	10.2
1931	2,218	1,632	410	176	9.7
1932	2,342	1,850	355	137	6.9
1933	2,277	1,806	280	191	9.6
1934	2,261	1,801	330	130	6.7
1935	2,368	1,831	408	129	6.6
1936	2,517	1,989	353	175	8.1
1937	2,735	2,151	397	187	8.0
1938	2,992	2,308	493	191	7.6
1939	3,221	2,476	443	302	10.9
1940	3,188	2,597	363	228	8.1
1941	3,318	2,749	332	237	7.9
1942	3,607	3,014	391	202	6.3
1943	4,514	3,671	606	237	6.1
1944	5,363	4,235	759	369	8.0
1945	5,614	4,468	886	260	5.5
1946	5,912	4,730	898	284	5.7
1947	6,249	4,965	1,002	282	5.3
1948	6,389	5,194	902	293	5.3
1949	6,493	5,376	880	237	4.2
1950	6,596	5,630	665	301	4.5
1951	6,602	5,601	699	302	4.5
Totals	97,827	78,525	13,207	6,095	6.2

The figures presented in the preceding tables represent examinations given. The number of persons tested during any one year is recorded for the 30 year period in table 48. The classifications "Passed" or "Failed" in cases in which more than one examination has been taken in a given year are based on the results of the last examination during the year in question. Thus, if in 1951 a candidate passed part 1 but at a subsequent examination in 1951 he failed part 2, he is computed in this tabulation as having failed. On this basis figures computed indicate that there were 6,602 persons who took at least one of the tests of the National Board in 1951 as compared with 525 in 1922. The trend has been steadily upward. For the 30 year period, 97,827 persons were examined in one or more of the annual examinations, of whom 78,525 passed, 13,207 took incomplete examinations, and 6,095 (6.2%) failed.

TABLE 49.—*Licenses Granted on the Basis of National Board Certificates, 1951*

Alabama	12	New Hampshire	22
Arizona	5	New Jersey	126
Arkansas	3	New Mexico	6
California	216	New York	580
Colorado	22	North Carolina	28
Connecticut	114	North Dakota	4
District of Columbia	76	Ohio	87
Georgia	21	Oklahoma	4
Idaho	2	Oregon	21
Illinois	83	Pennsylvania	147
Indiana	16	Rhode Island	17
Iowa	17	South Carolina	7
Kansas	20	South Dakota	2
Kentucky	12	Tennessee	14
Maine	21	Texas	3
Maryland	51	Utah	6
Massachusetts	203	Vermont	7
Michigan	46	Virginia	42
Minnesota	48	Washington	31
Mississippi	5	West Virginia	18
Missouri	29	Wyoming	2
Montana	2	Alaska	2
Nebraska	9	Hawaii	10
Nevada	1	Puerto Rico	14
Total			2,234

In 1951, there were 2,234 licenses to practice medicine issued by endorsement of the certificate of the National Board of Medical Examiners in 44 states, the District of Columbia, Alaska, Hawaii, and Puerto Rico. The number registered by each of these licensing boards is recorded in table 49. There have been 22,159 licenses issued on the basis of endorsement of the board's certificate by the various states, territories, and outlying possessions since 1915.

The constitution of the board provides for a membership of 32 persons, representing the federal services, the Federation of State Medical Boards of the United States, the Association of American Medical Colleges, the Council on Medical Education and Hospitals of the American Medical Association, and members elected at large. The officers of the Board are:

Howard T. Karsner, M.D., President

John P. Hubbard, M.D., Executive Secretary and Treasurer

J. Stewart Rodman, M.D., Medical Secretary

Everett S. Elwood, Editor and Consultant on State Board Relations.

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THE FIFTIETH ANNUAL REPORT ON MEDICAL LICENSURE

The 50th annual report on medical licensure by the Council on Medical Education and Hospitals, which appears in this issue of THE JOURNAL, presents statistics concerning the medical examination and licensure of physicians in the United States and its territories and outlying possessions for the year 1951 and summarizes trends over many years. There is also included information pertaining to the current regulations for medical licensure.

During the year 1951 there were 12,008 licenses to practice medicine issued by the medical examining boards of the 48 states, the District of Columbia, Alaska, Hawaii, Puerto Rico, Guam, the Virgin Islands, and the Canal Zone. Of the 12,008 licenses issued, 5,713 were granted after written examination and 6,295 by reciprocity or endorsement of state licenses or the certificate of the National Board of Medical Examiners. There was a decrease of 201 in the number of physicians licensed in 1951 as compared with the previous year, although the number of licenses granted exceeded the average annual prewar registration by more than 3,000.

The data presented indicate that last year 6,325 physicians received their first license to practice medicine and thus represent additions to the medical profession. In the same period there were about 3,700 deaths of physicians reported, so that there was a net gain of 2,625 in the physician population in the United States and its territories and outlying possessions. The figure represents an increase of 417 in comparison with the net increase in 1950.

The percentage of failures in the written examination from existing approved medical schools in the United States was 2.9%; of graduates of approved medical schools in Canada 11.8% failed; of the graduates of approved medical schools no longer in operation 7.2% failed; 74.2% of the graduates of unapproved medical schools in the United States failed; the graduates of schools of osteopathy admitted to medical licensure examinations in several states had 23.3% failures, and 47.9% of the foreign trained physicians examined for medical licensure last year failed. The total percentage of failures was 11.7%.

The report includes the preprofessional and professional educational requirements of each licensing board, the states requiring an internship for licensure, regulations pertaining to the registration of interns and residents, licensure on the basis of government credentials, the issuance of temporary permits, and states requiring annual registration of physicians.

The second section of the report pertains to the results of examinations given by the 21 boards of examiners in the basic sciences. Certificates of proficiency in the basic sciences were issued to 5,137 candidates in 1951. Of these certificates, 3,198 were issued after written examination and 1,939 by exemption, waiver, reciprocity, or endorsement. Among graduates of approved medical schools in the United States, foreign trained physicians, graduates of unapproved medical schools in the United States, and medical students who took the written test, 11.3% failed. There were 37% failures in written examination by other practitioners.

The final section of the report deals with the examinations given by the National Board of Medical Examiners. The examination of the National Board is given in three parts; the first part may be taken after completion of the sophomore year in medical school, the second part on completion of the medical course, and the third part after a year of hospital service. There were 6,602 persons who took at least one of the tests of the National Board in 1951, and 1,708 physicians were certified as diplomates. The medical licensing boards of 46 states, the District of Columbia, Alaska, Hawaii, Puerto Rico, and the Canal Zone recognize the certificate of the National Board of Medical Examiners as an adequate qualification for a medical license. In 1951, there were 2,234 licenses to practice medicine issued by endorsement of the certificate of the National Board in 44 states, the District of Columbia, Alaska, Hawaii, and Puerto Rico, representing graduates of 62 medical schools in the United States, 6 in Canada, and 10 medical schools of other countries.

The presentation of this study is made available through the cooperation of the various examining and licensing boards. For their cooperation the Council and THE JOURNAL wish to express appreciation.

LICENSURE OF GRADUATES OF FOREIGN MEDICAL SCHOOLS

A study of the current report on medical licensure reveals that in many states the licensure of foreign trained physicians has been given serious consideration by the authorities and that methods have been devised to provide for licensure of qualified foreign trained physicians without lowering the standards of medical practice in the United States. Four states that heretofore did not license foreign trained physicians have specified that they may file applications. In several other states the regulations have been modified. Of the 43 boards that license foreign trained physicians, 9 do not require citizenship, 12 require that the applicant file first citizenship papers only, and 22 boards require full citizenship. Twenty-eight boards indicate the foreign trained physician must serve an internship or obtain further medical training in the United States.

The current list of 49 foreign medical schools in 13 countries compiled by the Council on Medical Education and Hospitals in collaboration with the Executive Council of the Association of American Medical Col-

leges is included in the report. These two bodies recommend that graduates of these schools be considered on the same basis as graduates of approved medical schools in the United States. The initial list of foreign medical schools was published in February, 1950, and the current list represents the third revision. The present list is not final, and other schools will be added as information is obtained on which to base an evaluation. The position of the Council and the Executive Council with respect to schools not listed is that they neither approve nor disapprove these schools. Until an evaluation is possible, it is the responsibility of individual institutions and organizations in the United States to place their own evaluation on the credentials presented.

Twenty-three licensing boards have reported the acceptance of this list in the consideration of applicants for licensure. Twelve of these boards stipulate that recognition is limited to graduates of schools on the list; two boards specify that graduates of foreign medical faculties after Jan. 1, 1940, are not eligible for licensure unless they have graduated from a school on the published list or have done some special work in an approved medical school in the United States or in a recognized hospital; and one board will accept other graduates if they possess either a certificate of the National Board of Medical Examiners or one of the American Boards in the specialties. The remaining eight boards have reported they accept the list but do not specify whether they also accept graduates of other schools.

Last year graduates of 142 foreign medical schools and 4 licensing corporations of Great Britain were examined. Graduates of medical schools in the Philippines, 11 South and Central American countries, 27 countries in Europe, and 8 in Asia were represented at examinations. The number examined totaled 1,006. These physicians were tested in 34 states and Alaska. The number who were successful was 524; failures numbered 482, or 47.9%. Of the 524 foreign trained physicians licensed in 1951, 450 were not previously licensed in the United States and therefore represent additions to the physician population in the United States. In the previous year, there were 308 additions to the profession from this group.

ACTH AND CORTISONE IN HYPERSPLENIC SYNDROMES

Considerable evidence has been accumulated to suggest that corticotropin and cortisone may be of practical therapeutic significance in the cytopenias of hypersplenism, particularly idiopathic thrombocytopenic purpura. This is in contrast to the ineffectiveness of these hormones in thrombocytopenic purpura when the marrow is hypoplastic, or when there has been depression of platelet formation by chemical intoxication or irradiation.

Robson and Duthie [1] administered corticotropin to two patients with idiopathic thrombocytopenic purpura. Definite clinical remission was induced on three occasions in these two patients. Bethell and his co-workers [2] reported on six patients with idiopathic thrombocytopenic purpura in whom administration of corticotropin or of cortisone resulted in complete clinical and hematological remissions. In three of the patients remissions have persisted for periods of four to six months. In two patients with splenic neutropenia and arthritis (Felty's syndrome) relapse occurred in less than two weeks after the discontinuation of corticotropin therapy. These authors conclude that the spleen exerts a regulatory action, susceptible of derangement, on the maturation and release of granulocytes and thrombocytes, and that this function may be under the control of the adrenal cortex.

Wintrobe and his co-workers [3] noted in a patient with idiopathic thrombocytopenic purpura a rise in the platelet count on administration of corticotropin, with reduction of the bleeding time to normal and improved clot retraction, but the changes that followed the subsequent splenectomy were much more pronounced. Faloon and associates [4] administered corticotropin to three patients with thrombocytopenia. Two of these were adolescent girls, and one was a man 58 years old who had had no remission in thrombocytopenia or vascular fragility following splenectomy one year previously. All showed prompt improvement in vascular fragility. In the two girls, platelet counts and associated coagulation findings subsequently became normal, but no improvement occurred in the thrombocytopenia of the man. In all three patients discontinuance of corticotropin therapy was followed within a short time by a return of the hemostatic defects. One of the girls was subsequently given cortisone orally, with maintenance of normal vascular resistance but with almost complete relapse in thrombocytopenia and associated abnormalities. In addition, these authors administered cortisone to a woman 66 years old who had had a temporary remission of thrombocytopenia following splenectomy six years previously. While her capillary resistance approached normal, there were no changes in the platelet count or coagulation phenomena. These workers suggest that different adrenal hormones may be responsible for improvement in the vascular resistance and the platelet counts respectively.

Evans and Liu [5] reported two remissions following corticotropin therapy in a patient with severe primary thrombocytopenic purpura who had undergone splenectomy. On the basis of these results they suggest that the disease may be due to an abnormal immune response. Jacobson and Sohier [6] noted that in three patients with idiopathic thrombopenic purpura, one of whom had undergone splenectomy, administration of corticotropin or of cortisone caused a prompt rise in platelets. However, on withdrawal of the hormones, the original hematological status returned within a relatively short time. The authors suggest that these hormones may be used for preparing a patient for a splenectomy so that the operation

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2. Bethell, F. H.; Miller, S., and Meyers, M. C.: Administration of ACTH and Cortisone in Hypersplenic Syndromes, Proceedings of the Second Clinical ACTH Conference, Philadelphia, the Blakiston Company, 1951, vol. 2, p. 173.
3. Wintrobe, M. M., and others: Effects of ACTH on Hematopoietic System, Blood **5**: 789 (Aug.) 1950.
4. Faloon, W. W.; Greene, R. W., and Lozner, E. L.: Hemostatic Defect in Thrombocytopenia as Studied by the Use of ACTH and Cortisone, J. Clin. Investigation **30**: 638 (June) 1951.
5. Evans, R. S., and Liu, C. K.: Effect of Corticotrophin on Chronic, Severe Primary Thrombocytopenic Purpura, A. M. A. Arch. Int. Med. **88**: 503 (Oct.) 1951.
6. Jacobson, B. M., and Sohier, W. D.: Effects of ACTH and Cortisone on Platelets in Idiopathic Thrombopenic Purpura, New England J. Med. **246**: 247 (Feb. 14) 1952.

may be performed in the presence of a normal number of platelets of endogenous origin, or if splenectomy is not indicated or the spleen has already been removed, either hormone could be administered to tide the patient over a critical bleeding episode.

The mode of action of corticotropin and cortisone on the hemopoietic system is still obscure. Wintrobe [7] points out that the cortical hormones may exert a potentiating and regulating effect, influencing many body processes for which they are not essential. Hence in certain hematopoietic disorders, the response might vary with the nature and severity of the underlying process and whether resistance to the effects of the drugs develops.

EXPERT MEDICAL ADVICE FOR FOREIGN COUNTRIES

The United States of America has been particularly fortunate as its health activities have increased. The availability of education, the flow of materials for production, and the high standards of living have permitted this nation to assume a leadership of which it can be proud. And yet at the same time this leadership can be a means of flagrant abuse if it is not closely watched. For example, countries that are temporarily less fortunate but who wish help so that they too can apply the benefits of modern knowledge to their people may turn to the United States for advice. If the services of properly qualified persons are proffered, the outcome will be satisfactory to all. Too often, however, when one government seeks help from another, the wrong "experts" are sent in response. Instead of men and women who are qualified on the basis of actual experience, others who qualify simply because they hold the right titles in some organization or seem deserving of a junket with expenses paid are dispatched, sometimes with attendant publicity. There have been reports of so-called experts being sent to give advice in other countries on health topics in which they had not had any experience other than possibly some administrative background. This situation at best can only cause bewilderment, but, at worst, which usually is the case, it will cause resentment and ill will. When India, for example, requests expert advice on some of its problems, it truly desires the advice of experienced clinicians and health workers and not the conjectural reasoning of some swivel-chair theorist. It is a serious mistake to send someone who must first gain experience in the area to which he is sent in response to a call for help. The chances are excellent that the men and women in his new locality already know more from experience than he can possibly learn while he remains there. The inquiring country will certainly not believe it has a high standing in the eyes of the nation to which it appealed if it receives second rate or third rate advisers.

Sometimes voluntarily formed teams from universities, clinics, public health centers, or elsewhere are sent to areas needing help. These teams usually have their expenses paid, but it is not unusual to learn of men and women who go at their own expense. These are almost without exception composed of fully qualified scientists. Unfortunately, there are not many persons in these days of high taxes who can afford to sacrifice so much time and money. There is, however, a potential group of experts who would be delighted to provide help if their advice was sought; and it would cost little to acquire their services, perhaps only traveling expenses and a modest stipend for living, which could be promised even by the country seeking help if it were permitted to choose its own experts when it asked for expert guidance. This group consists of the men and women about to retire from their normal activities, whether it be medical practice or university or other life. Many would welcome the opportunity to offer their services for a few weeks or months or even for several years if they could be assured of living and incidental expenses.

Another source of criticism that has been reported has been the additional gratuitous and often misleading advice on other medical matters that has been given by falsely labeled experts even though they were not asked for such advice. Representatives of at least two countries have complained within the past few months that these so-called experts have promptly proceeded to tell the countries they were visiting how to organize their medical services, although they were sent only for a specific health problem. In each instance there was suggested a plan that would provide compulsory health insurance and full-time salaried physicians. Whether the visitors went as "experts" or propagandists seemed uncertain to the complainants.

The United States and the World Health Organization, which the United States supports, have many opportunities to share their knowledge on health matters so that persons all over the world can benefit. It would be a source of utmost regret if these opportunities were lost because of ill-conceived acts by their representatives.

THE INTERNATIONAL LABOR ORGANIZATION

In the Organization Section of this issue of THE JOURNAL there is an important statement from the World Medical Association. It concerns the International Labor Organization and certain fundamental principles for medical care. This organization is showing signs of increasing interest in medical care, and the members of the medical profession should be aware of this interest and the ways in which it might be made plainly evident in their countries. During June a conference will be held by the International Labor Organization in Geneva, and it is possible that from this meeting there may stem recommendations not in keeping with the principles for which American medicine has long fought. According to the statement issued by the World Medical Association, physicians in the United States are not alone in their desire to preserve freedom for patients and themselves; physicians elsewhere in the world have the same concern. Therefore, the medical profession in all 43 member countries of the World Medical Association will find much of interest in the statement on page 488 from their international medical association.

7. Wintrobe, M. M.: ACTH and Cortisone in Hemopoietic Disorders, Am. J. Med. 9: 715 (Dec.) 1950.

THE PRESIDENT'S PAGE

In another week, the largest medical meeting held anywhere in the world will convene in Chicago. It is the Annual Session of the American Medical Association, which is meeting for the 101st time. About 14,000 physicians are expected to register. The total number of persons arriving for the convention, including Auxiliary members, exhibitors, and guests, will exceed 28,000. The annual sessions are so large that only four cities in the country can handle them—Chicago, New York, Atlantic City, and San Francisco.

Statistics regarding the coming Chicago meeting are staggering. Most scientific activities are scheduled for Navy Pier, a long hall (five-eighths of a mile) with few facilities other than walls and a roof. This means the Association must bring in over 16,928 feet of partitions for meeting rooms, 10,000 chairs, and its own motion picture screens, projectors, sound equipment, podiums, and blackboards. It must black out 9,800 window panes to provide for movies, lantern slides, and television. It must even provide such trivia as water pitchers, glasses, and brooms. If the scheduled scientific and technical exhibits could be placed end to end, they would stretch for more than three miles!

Size, however, is not the goal but rather the result of the excellence and variety of the scientific programs presented at A. M. A. sessions. Since the Association includes all branches of medicine within its membership, the Annual Session must provide material of interest and significance to all physicians. Its success in achieving this goal is proved by the ever-growing popularity of the meetings.

Physicians attending the convention will have the opportunity to hear two days of general scientific lectures and three days of programs in the specialties. They can view more than 700 scientific and technical exhibits. On receivers in Navy Pier doctors will be able to watch surgical and clinical procedures televised in color from Wesley Memorial Hospital. A full five day program of medical motion pictures will be offered.

In addition, the House of Delegates will be meeting at the Palmer House during convention week. It will be faced by important policy decisions.

On Tuesday night the new President, Dr. Louis H. Bauer, will be installed. At the same time the Association will present its Distinguished Service Medal to a physician who has made an outstanding contribution to the science of medicine. These ceremonies will be broadcast over two coast-to-coast radio networks. Following this program, a half-hour television show will originate at Navy Pier to give physicians at home and the general public a glimpse behind the scenes at an A. M. A. convention. Another half-hour show will be televised over the NBC-TV network on Wednesday evening.

During convention week, too, the Woman's Auxiliary holds its annual meeting; guided tours will be conducted daily at A. M. A. headquarters; a daily convention newspaper will be published; and many related organizations will hold meetings. For the first time this year the National Association of Science Writers is meeting in conjunction with the A. M. A. Session.

You can see from this sketch that an A. M. A. convention is a great and complex production; yet, if all goes as usual, the multitudinous activities of convention week will proceed effectively and smoothly. This is no accident. The headquarters staff at A. M. A. begins working on a convention three years in advance, and it is their painstaking efforts, plus the cooperation of local committees on arrangements, which preface the smooth performance.

Arrangements for meeting rooms, exhibit space, and hotel accommodations are made very early by the Secretary and Business Manager. It is necessary to tie up practically all hotel rooms in a convention city to handle the influx of physicians. The Secretary's Office also serves the House of Delegates. Reports to the House and resolutions to be introduced must be printed in an advance handbook for the delegates. Arrangements have to be made for registration, credentials, and badges. During House sessions, multiple copies of new resolutions must be prepared, and reports of reference committees have to be transcribed and typed. A corps of top secretaries from the various departments of the Association is recruited to assist the Secretary's Office staff with this voluminous work.

All arrangements for the technical exposition are handled by the Advertising Department, which regularly works with the exhibiting companies, most of whom advertise in A. M. A. publications. This department also prepares promotion pieces used to publicize A. M. A. meetings to physicians.

Registration of physicians and guests at the Convention (and it is no small task to register some 25,000 persons in five days) is handled by the Membership Records Department of the A. M. A. Before receiving his badge, each physician's membership status must be checked.

Press and magazine publicity for the convention is handled by the Public Relations Department, which maintains press rooms at both the Palmer House and Navy Pier. The PR Department also edits the Daily Bulletin, the convention newspaper. Radio and television coverage of the Session is arranged by the Bureau of Health Education.

The scientific activities, which form the major portion of the Annual Session, are planned by several groups. The Council on Scientific Assembly arranges for the general meetings, and each of the sections represented on the Council plans the program for its particular specialty. There are now 20 sections in the Council, including Anesthesiology; Dermatology and Syphilology; Diseases of the Chest; Experimental Medicine and Therapeutics; Gastro-Enterology and Proctology; General Practice; Internal Medicine; Laryngology, Otology and Rhinology; Military Medicine; Nervous and Mental Diseases; Obstetrics and Gynecology; Ophthalmology; Orthopedic Surgery; Pathology and Physiology; Pediatrics; Physical Medicine and Rehabilitation; Preventive and Industrial Medicine and Public Health; Radiology; General and Abdominal Surgery; Urology; and a special section on Miscellaneous Topics to cover other fields. Many of the papers presented are later published in THE JOURNAL.

The Scientific Exhibit is prepared under the direction of the Association's Committee on Scientific Exhibit. Each section arranges displays in its field. In addition, the Committee develops several special exhibits for each meeting. In Chicago these will include exhibits on fractures, fresh pathology, and the latest methods of resuscitation, under simulated rescue conditions in the waters of Lake Michigan at the end of Navy Pier. Three exhibit symposiums are planned on overweight, diabetes, and cardiovascular diseases. Question and answer sessions on each of these topics will be held in rooms adjacent to the exhibits.

The motion picture program is planned by A. M. A.'s Committee on Medical Motion Pictures. In Chicago, 22 different films, 3 of which are première presentations, will be shown. Color television is sponsored by Smith, Kline and French laboratories and arranged in cooperation with Chicago physicians.

Planning and staging an A. M. A. meeting is a gigantic cooperative effort. The result was once described to me as "a complete postgraduate education under one roof." This meeting, as well as the Clinical Session, is a service provided by the A. M. A. to its members in line with the Association's purpose "to advance the science and art of medicine."

JOHN W. CLINE, M.D., San Francisco.

ORGANIZATION SECTION

RESOLUTIONS TO BE PRESENTED TO HOUSE OF DELEGATES

The Secretary of the Association has been informed that the following resolutions will be submitted to the House of Delegates at the Chicago Session in June by a delegate of the Medical Society of the District of Columbia.

RESOLUTION ON CANDIDATES FOR PUBLIC OFFICE

WHEREAS, It is the duty of every physician to discharge all the responsibilities of citizenship including those of a political nature; and

WHEREAS, It is not the function of his professional medical organization to participate in partisan politics; therefore be it

Resolved, By this House of Delegates that The American Medical Association does not support any political party or any candidate for elective public office.

RESOLUTION ON MEDICAL CARE TO VETERANS

Resolved, That The American Medical Association favors action looking toward the reduction of medical care to veterans with nonservice-connected disabilities except where the inability to provide for such service can be demonstrated.

RESOLUTION ON MEDICAL AND HOSPITAL BENEFITS FOR DEPENDENTS OF SERVICE PERSONNEL

Resolved, That legislation to provide medical and hospital benefits for dependents of service personnel at federal expense be opposed by the American Medical Association until need for such legislation is clearly demonstrated.

RESOLUTION ON TRANSFER OF DISABLED VETERANS

Resolved, That the American Medical Association favors the transfer of seriously disabled veterans from service hospitals to Veterans Administration facilities.

RESOLUTION ON REACTIVATION OF COMMITTEE ON MOTOR VEHICLE ACCIDENTS

WHEREAS, The continuing high mortality and disability due to automobile accidents is cause for great concern;

WHEREAS, There is need for further efforts to reduce the number of accidents; therefore be it

Resolved, By this House of Delegates that the Committee on Motor Vehicle Accidents of the American Medical Association be reactivated.

THE WORLD MEDICAL ASSOCIATION

The International Labor Organization will hold a conference in Geneva in June, 1952. One of the main topics of discussion will be the minimum standards of social security, including medical care. There will also be some discussion on possible maximum standards. The proposed convention on these standards, if adopted by the conference, will be sent to all member countries of the ILO (of which the United States is one) for ratification. Ratification of such a convention by the United States may seriously affect the status of medical care for patients, as well as the status of the medical profession in this country.

The program envisages the inclusion of (1) 20% of the population; (2) 50% of all employees; or (3) 50% of all residents. The minimum standard requires (1) general practitioner care, (2) specialist care both in and outside of hospitals, (3) essential pharmaceutical supplies, and (4) hospitalization when necessary. There are also provisions for maternity care, including prenatal, confinement, and postnatal care.

Details of the proposed plan will be found in a large document, Report V (a) (2), Minimum Standards of Social Security, issued by the International Labor Office in 1952. It is suggested that physicians obtain this document for their information. At the end of the above document there is appended a "Statement of WHO Consultant Group." This statement was prepared at the request of the ILO by a consultant group of medical experts for the purpose of reviewing the medical provisions of the proposed convention. This consultant group was composed of the following persons: Dr. E. Aujaleu, Directeur de l'Hygiène sociale au Ministère de la Santé publique et de la Population (France); Dr. A. Leslie Banks, professor of human ecology, University of Cambridge (United Kingdom); Dr. C. van den Berg, Director-General for International Health Affairs (Netherlands); Dr. J. Axel Höjer, Director-General of Public Health (Sweden); Dr. René Sand, Professeur honoraire à l'Université libre de Bruxelles (Belgium); Dr. Henry E. Sigerist, research associate, Yale University, United States of America (resident in Switzerland).

It will be noted that not a single member of this group is a practicing physician. The Secretary General of the World Medical Association has written a strong protest to WHO on the appointment of such committees, which disregards an opportunity of the practicing profession to present its viewpoint.

The report issued by the consultant group, and which will reach all delegates to the ILO convention, definitely recommends a full-time salaried medical service. It discusses the fee for service system and ruthlessly discards it, stating that "the system exposes the physician to the temptation to care for a patient who should be sent to a specialist or an institution. It gives an incentive for the prolongation, rather than the reduction of illness." It then discusses the capitation system, which it thinks better than the fee for service system, but discards it as "permitting a perfunctory quality of medical care since the physician receives no more reward for extra service." Finally, it lauds the salary system in an illogical and unfounded manner.

The Council of the WMA, after considering the documents above quoted and the report of its Social Security Committee directed that a statement presenting the views of WMA be sent to the ILO and to all member associations. This statement contains a discussion of the philosophy of social security. It also restates the principles adopted by the Second General Assembly of WMA in 1948, and it evaluates and clarifies those principles.

The council held an interview on April 30, 1952, with Miss Laura Bodmer of ILO, during its meeting at Brussels. Later, on May 7, the president of WMA, Dr. Dag Knutson, the Consultant General, Dr. T. C. Routley, the Liaison Officer, Dr. Jean Maystre, and the Secretary General, Dr. Louis H. Bauer, interviewed the Deputy Director General of ILO and two of his associates, at Geneva. While Mr. Rao, the Deputy Director General, intimated that he would be personally interested in reading the document, it would serve no useful purpose for the WMA representatives to leave it with him, as he could not have it distributed to the delegates. Apparently, the only way it could reach the delegates would be either for the document to be sent to the chairman of the Conference Committee on Social Security (not yet appointed), who might distribute it, or for the World Medical Association to attempt to distribute it. Both methods will be used.

It is very important for all members of the A. M. A. to carefully read the document prepared by the Council of the World Medical Association. It is reproduced below.

The only section in the document that may puzzle American physicians is that pertaining to Principle XI, which reads "Compulsory health insurance plans should cover only those persons who are unable to make their own arrangements for medical care." In the United States physicians do not believe that compulsory plans are necessary for anyone. It must be remembered, however, that many countries do have compulsory plans, but the doctors in all countries that are members of the World Medical Association are in agreement that if such plans do exist they should be limited as expressed in the quoted statement. This does not mean, however, that the physicians endorse the principle of compulsory health insurance.

The document as a whole is an amazing example of how physicians of 43 nations think alike. It is a striking argument that the

A. M. A. was wise in supporting the World Medical Association, which is carrying the torch on an international level for freedom in medical practice, for quality of medical service to patients, and for elimination of political considerations in medicine. American physicians as well as all others of the free world owe much to the World Medical Association for its constructive thinking and action. The works of the association reveals why all members of the A. M. A. have been urged to become individual members of the United States Committee of the World Medical Association and thus render the Association moral and financial support in its undertakings. Membership is $10 per annum, and application can be made directly to the Secretary-General, World Medical Association, 2 East 103rd Street, New York 29.

STATEMENT BY THE COUNCIL OF THE WORLD MEDICAL ASSOCIATION

Social security is a concept of great interest to doctors. Its aims—to make possible the development of healthy and happy human beings—in theory, run parallel, even coincide, with those of the medical profession. This necessitates close relations between promoters of social security and medical men. The development of the notion of health during the first half of this century further stresses the need for cooperation between these two groups. Modern medicine more and more stresses that somatic health cannot be achieved without mental health. Health is a synthesis of mental and physical elements, tending toward a state of balance. The views of doctors have become close to those who have inspired the internationally adopted definition of health as complete mental, physical and social well-being.

There is, however, a strong theoretical element in this definition. Well-being is not equal to the sum of satisfactory mental, physical and social conditions as laid down in official and other documents. Rather it is based on an emotionally founded appreciation of these favourable circumstances. The social component, regardless of any absolute qualities it may possess, may not be felt as satisfactory and so will not contribute to a state of well-being. Decisive here are highly complex mental reactions, determined on the one hand by such factors as environment, character, education and heredity, and on the other by the means through which the social security has been achieved.

This is important. Social security as a product of individual effort and a reward for personal ability will promote mental well-being. More debatable are the psychological effects of such a security based on communal activity and on benefits distributed through official agencies sometimes only remotely connected with the beneficiary. Satisfaction leading to a feeling of well-being under such circumstances is very uncertain. Benefits are only too often mistaken for rights. In countries where systems for advanced social security are in operation, the outcome does not, in fact, seem to promote general happiness, a sense of personal obligation, mental well-being, or therefore, good health.

The average man cannot appraise the relationship between services rendered and equivalent returns, or judge whether he is getting a fair deal. He will tend to disregard the cost, and always suspect that he does not get a return for his money if, through taxation, he pays a lump sum for a number of benefits, each one of which seems to him to be small. If these taxes are high he will be further encouraged to demand more in return, and this, often for political reasons, generally leads to increased returns and to new benefits—at increased cost, increased taxes, and increased or renewed displeasures, all of which endanger mental well-being.

Another point might be made here. Most people are still brought up on old-established principles of ethics and behaviour. One of these is that a man should primarily be responsible for himself and his activities. He finds, however, that his activities are hedged round with restrictions and that many of his former responsibilities are being taken away from him. With them go much of his old freedom and even more of his earnings—and he finds himself burdened with new tasks, this time not for himself but for some remote conception such as the state or the community. Consciously or unconsciously he reacts with displeasure —and again his mental well-being suffers.

The psychological repercussions of modern social security schemes are not altogether satisfactory. They should be studied before new plans are made and further steps taken—or they will get worse. Naturally conditions vary, and the descriptions given of the average man's dilemma are not universally applicable. But they are applicable to those "advanced" countries where efforts to solve the individual's problems by collective measures have had considerable practical consequences, and which are, therefore, held up as examples to others still having a long way to go before they can begin even to think in terms of an advanced social security, or indeed any security at all. Because of this it is imperative that the medical profession's experiences of the functioning of social security schemes should be made known to promoters and administrators of such schemes. They, too, should continuously consult the medical profession before new plans are made or old ones remade, because it is intended that doctors become more and more involved in the determination of liabilities under the systems adopted.

Fundamental for the success of any security system is its psychologically correct structure. It must not allow the individual to forget that his security is primarily a matter for his own efforts. It is unwise for him to be led to believe that the state or community can take over and relieve him of his responsibilities. Any system created without due observance of this will from the very beginning carry within itself its own seeds of destruction. On the one hand it will never really contribute to health equal to well-being—for reasons already given. It will defeat its own ends. On the other hand it will tend to a steady and uncontrollable expansion at equally uncontrollable costs. These serious consequences are already seen in many countries, and they will, with growing over-population and increasing average length of life, become impossible to master. The productive capacity of the country will be so heavily burdened for the benefit of an increasing number of consumers that governments will in the end not be able to stand the cost, unless other equally or even more important fields of activity are neglected. As "social security" in many parts of the world is the political slogan of the day this may well happen—and as a matter of fact does happen.

The extent to which the individual and his country contribute to his welfare and that of his fellow citizens is a problem for each country to solve, but it is always of great importance to the medical profession. Doctors are concerned because of their experience with various schemes that have been proposed and sometimes adopted. As ILO states, there is a growing tendency to set up public services affording complete medical care, preventive or curative, without distinction of the temporary or chronic nature of the contingency or of occupational or general origin of the disease or accident. There is also a tendency to loosen the ties between benefit right and contribution payment, and to create a public service for the citizenry at large, making all care and supplies available at any time and without time limit, subject only to the doctors' judgment.

The WMA considers this to be incompatible with principles which it believes to be fundamental. If the ties between benefit right and contribution payment are loosened, the individual will ignore the cost of the services given. If insurance principles are abandoned for public service schemes, he will tend to lose his sense of responsibility. If social security costs burden the individual with heavy taxes, he will end by asking for compensation in the shape of more benefits, and he will tend to place his security more or less completely in the hands of society, forgetting that this society after all is nothing but himself and his neighbours.

All this complicates matters for the medical profession. It is willing and eager to shoulder its own responsibilities. The success of its work, however, is the result of team-work where the team consists of two members: the doctor and his patient. Much depends on the cooperation of the latter. Restoration to health to a great extent depends on the will of the patient to get well: this must be encouraged. If the will is there, doctors can the more easily heal their patients as well as control the functioning of social security in their own field—both fairly successfully. If it is not, they will probably fail.

The WMA would finally like to point out that everywhere in the field of social security stress should be laid on prevention and rehabilitation. The primary aim must be to create health conditions of living—for example, with regard to housing, nutrition, clothing, recreation and working conditions. The higher a country's development, the less should be the need for official promotion of social security. It might well be asked whether an extensive and costly social security system really is a sign of soundness and advanced development of a country.

The WMA has in this paper so far dealt with some of the consequences of social security which have an indirect influence on the work of doctors. There are more direct ones, the intensity and scope of which are in proportion to the extent to which the medical profession is employed by or tied to the social security organization. As the doctor and his patient form a sort of unit, it is impossible here to make clear distinctions—what has an influence upon the one affects also the other. However as a social security scheme can do anything between two extremes—one leaving the medical profession entirely free, and the other transforming it into a group of whole-time employees—the General Assembly of the WMA, at its meeting in Geneva, 1948, set down the following twelve principles of social security, as expressing the views of the profession on the relationship between itself and social security:

Whenever medical care is provided as part of social security, the following principles should govern its provisions:

I. Freedom of choice of physician by the patient. Liberty of physician to choose patient except in cases of urgency or humanitarianism.

II. No intervention of third party between physician and patient.

III. Where medical service is to be submitted to control, this control should be exercised by physicians.

IV. Freedom of choice of hospital by patient.

V. Freedom of the physician to choose the location and type of his practice.

VI. No restriction of medication or mode of treatment by physician except in case of abuse.

VII. Appropriate representation of medical profession in every official body dealing with medical care.

VIII. It is not in the public interest that physicians should be full-time salaried servants of the government or social security bodies.

IX. Remuneration of medical services ought not to depend directly on the financial condition of the insurance organization.

X. Any social security or insurance plan must be open to the participation of any licensed physician, and no physician should be compelled to participate if he does not wish to do so.

XI. Compulsory health insurance plans should cover only those persons who are unable to make their own arrangements for medical care.

XII. There shall be no exploitation of the physician, the physician's services or the public by any person or organization.

Some of these principles are self-explanatory, others, perhaps less so. The World Medical Association would like to make the following comments thereon, in order to clarify their meaning:

I. Freedom of Choice of Physician by the Patient. Liberty of Physician to Choose Patient Except in Cases of Urgency or Humanitarianism.—Administrative and financial considerations must not be allowed to interfere with the freedom of the patient to choose (and change) his doctor and vice-versa. The intimate personal relationship between physician and patient makes any compulsion harmful, for where there is compulsion, trust and confidence are impaired to the detriment of the patient's welfare.

II. No Intervention of Third Party Between Physician and Patient.—When medical care is provided as part of social security, the state or the local authority or the insurance company enters into relationship with patient and doctor. Such relationship must not involve interference with the essential freedoms of either, and no method of payment of doctor or condition of service should be introduced without prior consultation with and the consent of the medical profession.

III. Where Medical Service Is to Be Submitted to Control, This Control Should Be Exercised by Physician.—The greater the knowledge of what is being controlled the more efficient—and in medicine the more human—will be the control. Non-medical control of medical service introduces elements of distrust and frustration. The medical profession has never been short of able and devoted doctors, experienced in the practice of medicine, who are prepared to undertake administrative responsibility, and they should hold key positions in the administrative direction of medical services. Medical administrators should be so chosen as to command the fullest confidence of all concerned.

IV. Freedom of Choice of Hospital by the Patient.—This freedom must of course have some topographical and medical limitation. It is directed against compulsory usage by patient and doctor of a hospital simply because of its propinquity.

V. Freedom of the Physician to Choose the Location and Type of His Practice.—Except in time of national emergencies, the medical profession is resolutely opposed to the direction of practicing physicians to certain places or to certain types of work. Such direction is an infringement of the liberty of the subject. Negative direction—that is direction by exclusion, is something which may be against the real medical interests of the community in which it operates.

VI. No Restrictions of Medication or Mode of Treatment by the Physician Except in Case of Abuse.—The freedom of the doctor to prescribe according to his conscience whatever treatment he thinks necessary for his patient is fundamental to the art and science of medicine. Any compulsion on the doctor to prescribe specific forms of treatment would be to impose on him a therapeutic orthodoxy which would hinder the progress of medicine.

VII. Appropriate Representation of Medical Profession in Every Official Body Dealing with Medical Care.—Just as doctors should be in positions of control at every level in the administrative work connected with medical care under social security schemes, so should they be fully represented on the various advisory bodies at every level. The association of the organized medical profession with controlling and advisory bodies will evoke the maximum sense of responsibility in the medical profession to the community it serves and so be in the highest interests of the patients.

VIII. It Is Not in the Public Interest That Physicians Should Be Full-Time Salaried Servants of the Government or Social Security Bodies.—This principle is directed against the practice of personal medicine by full-time salaried doctors against, that is, a full-time salaried state medical service. It is recognized that if the medical profession is to be in a position of control in providing medical care in social security schemes, some full-time salaried administrative posts must be occupied by doctors. It is recognized, too, that some full-time salaried doctors, for example, medical superintendents may have to be appointed in hospitals owned by the state or the municipality. But as human beings, including doctors, are so variously endowed by nature unequal in their mental and physical capacities, any attempt to equalize them by establishing fixed salaries will lend to frustration of spirit, discontent, inefficiency, idleness and an unbalanced state of affairs. As a general rule, to pay by salary carries risks of imposing limitation of effort, and in the case of the physician who provides personal medical care this is against the interests of the patient, in fact, detrimental to him. It is a sound principle to leave each practicing doctor the task of imposing upon himself those limitations of effort which by experience he knows are necessary if he is to give of his best to the patients under his care. Any attempt to restrict hours of work or capacity for earning a reward for work ineurs the grave risk of attempting to produce a standard doctor for a standard patient, to put human nature into a strait-jacket.

IX. Remuneration of Medical Services Ought Not to Depend Directly on Financial Condition of the Insurance Organization.—The remuneration of doctors providing medical care in a social security scheme must be related to their status and prestige in the community, to the duration, arduous nature and costs of their education, and to the hazards of an occupation which means constant strain and exposure to such risks as infection.

The cultural and ethical standards of a civilized society depend for their maintenance and promotion principally upon the integrity and examples of the learned professions, of which medicine is one—and one whose influence on society is now greater than at any other time in history. There is a grave danger that social security schemes, however idealistically conceived, will progressively diminish the cohesive moral and cultural force emanating from the corporate life of the learned professions. The fundamental fallacy of the planners of social security schemes is the ignoring of this force, coupled with a tendency to regard practicing doctors merely as technicians employing certain technical skills.

X. Any Social Security or Insurance Plan Must Be Open to the Participation of Any Licensed Physician and No Physician Should Be Compelled to Participate If He Does Not Wish to Do So.—Self explanatory.

XI. Compulsory Health Insurance Plans Should Cover Only Those Persons Who Are Unable to Make Their Own Arrangements for Medical Care.—With the high cost of medical care at a time of rapid expansion of medical science, the medical profession recognizes that in a wide range of physical and mental disorders the individual's capacity to meet the full cost of treatments and of restoration to health is often severely limited. But the greater the degree and range of compulsion the greater will be the loss of personal responsibility. To impose compulsory insurance upon those able to care for themselves is to attack the rights and ideals of minorities in society. The WMA believes that assistance through social security schemes should be given only to those who need it. Those who do not need it should make provision for themselves either through thrift or through voluntary insurance.

XII. There Shall Be No Exploitation of the Physician, the Physician's Services or the Public by Any Person or Organization.—Self explanatory.

CONCLUSION

All schemes of social security more or less restrict the liberty of the individual. Such restrictions are and must be accepted by persons living in a community, as a form of self-government. Doctors are interested in and welcome plans for medical care which enable them to look after their patients more efficiently.

Doctors are, however, perturbed by possible unfavourable effects of social security schemes on individual men and women. While they recognize that society has an obligation to help those who through nature, nurture, accident, disease and environment are handicapped in the struggle to survive, they fear the demoralizing effects of state paternalism exercised on adults.

A powerful factor in recovery from illness and in restoration to health is the sense of personal responsibility of the patient for what happens to him. This is something indispensable in the doctor-patient relationship. In what is called the Welfare State social security schemes loom large, and in these schemes the provision of (apparently) free medical services is important. The more the State does for the individual in this direction, the less is the individual sense of obligation and responsibility.

Apart from these psychological considerations, financial implications of social security schemes cannot be without concern to doctors. For example, the demand of patients for drugs leads to a disproportionate expenditure on ineffective remedies. This diverts money from what may be more important medical services, because expenditure on medical services of all sorts cannot be unlimited—except in Utopia.

Modern medical thinking stresses the balance of mental and physical factors in the health and well-being of the individual. Any social security scheme which stresses one factor and neglects the other will disturb this balance to the disadvantage of the individual.

Therefore, it is recommended that:

1. When social security schemes are necessary, they should be developed in the closest collaboration with the medical profession. Such schemes should take into account the psychological effect on the beneficiaries of increased dependency and diminished responsibility. Therefore,

2. The fundamental aim of a social security scheme should be to raise the individual to a level at which he can help himself. From this, it follows that:

3. Any social security scheme should contain elements that encourage self-reliance and a sense of personal responsibility, and that:

4. Any social security scheme should stress the obligation of the individual to make at least part of his contribution directly to the functioning and costs of the scheme.

ADDENDUM

The following resolution has been presented by the reference committee on miscellaneous business of the House of Delegates of the Medical Society of the State of New York.

WHEREAS, in June, 1952, the International Labor Organization will hold an international meeting composed of representatives of government, management and labor; and

WHEREAS, at this meeting there will be considered the subject of "Minimum Standards of Social Security" which will include the subject of medical care; and

WHEREAS, the International Labor Organization has made no attempt to obtain the opinions of the practicing medical profession; and

WHEREAS, the World Health Organization at the request of the International Labor Organization appointed an Expert Committee on Medical Care in Social Security; and

WHEREAS, that is the only report from any section of the medical profession which will be submitted to the delegates at the International Labor Organization meeting; and

WHEREAS, there was not a single practicing physician on this committee; and

WHEREAS, that report of the World Health Organization Expert Committee recommends a full-time salaried medical service; therefore, be it

Resolved, that the House of Delegates of the Medical Society of the State of New York urge its members to make contact with their senators, voicing disapproval of that section of the "Minimum Standards of Social Security," pertaining to the subject of Medical Care, as proposed by the International Labor Organization and in particular the report of the World Health Organization Expert Committee on Medical Care, which advocates a full-time salaried medical service; and be it further

Resolved, that the Medical Society of the State of New York, at its annual convention in New York, May 12-14, 1952, disapproves of these reports and memorializes the senators of this State to obtain and consider the opinions of the practicing profession in connection with any plan for medical care; and be it further

Resolved, that the delegates from the Medical Society of the State of New York be and hereby are instructed to introduce a similar resolution in the House of Delegates of the American Medical Association with the request that its membership communicate with their senators in regard to the resolution of the International Labor Organization, which pertains to medical care.

A. M. A. COUNCILS AND BUREAUS AVAILABLE FOR CONSULTATION AT CONVENTION

During the period June 9 to June 12 inclusive, representatives of the staffs of the various Councils and Bureaus of the Association will be available for consultation in the Exhibit Hall, South Pier, Booth C 149. The following schedule has been arranged:

Council on Industrial Health	9-10 a. m.
Council on Rural Health	9-10 a. m.
Bureau of Medical Economic Research	10-11 a. m.
Council on National Emergency Medical Service and Committee on Legislation	11 a. m.-12 noon
Bureau of Health Education	11 a. m.-12 noon
Council on Medical Service	1-2 p. m.
Washington Office	1-2 p. m.
Public Relations Department	2-3 p. m.
Membership and Records Department	2-3 p. m.

In addition, some of the Bureaus and Councils will have booths, in the vicinity of Booth C 149, where attendants will be available during the entire period.

MEDICAL NEWS

ARKANSAS

Hospital to Treat Arthritics Only.—The Leo N. Levi Memorial Hospital, Hot Springs, beginning Sept. 1, will be devoted entirely to treatment and research in the field of arthritis. This national hospital, which is dedicated to the free treatment of arthritics regardless of race or creed, hitherto also was utilized, since its founding by B'nai B'rith in 1914, as a general and emergency hospital for the Hot Springs area.

Personals.—Dr. James S. Taylor, colonel, U. S. Army, retired, has become chief of the medical staff of the Arkansas State Hospital for Nervous Diseases, Little Rock. He served as chief cardiologist for the army for the last five years at Walter Reed General Hospital, Washington, D. C.——Dr. William A. Reilly, head of the department of pediatrics at the University of Arkansas School of Medicine, Little Rock, has resigned to accept a position as chief of the radioisotope laboratory of the Veterans Administration Hospital at San Francisco.

CALIFORNIA

Society News.—At the annual session of the California Society of Allergy in Los Angeles, April 27-30, Dr. M. Coleman Harris of Vallejo was elected president; Dr. Grace M. Talbott of San Francisco, president-elect; and Dr. Norman M. Shure of Los Angeles, secretary-treasurer.

Narcotic Violation.—Dr. Andrew Salm, 12300 Stanwood Dr., Los Angeles, was convicted of violation of federal narcotic laws in the United States District Court for the Southern District of California at Los Angeles. On March 31 Dr. Salm was sentenced to two years. His sentence was suspended, and he was placed on probation for two years.

Hematology Research Funds Available.—The Commission of the Irwin Memorial Blood Bank of the San Francisco Medical Society announces that the blood bank has limited funds available for research in the field of immunohematology and transfusion therapy. Physicians desiring information on grants should contact Dr. Curtis E. Smith, chairman of the research committee for the Irwin Memorial Blood Bank of the San Francisco Medical Society.

CONNECTICUT

Nominated for the Bernard Foundation Prize.—Prof. Charles-Edward Amory Winslow of New Haven, professor emeritus of public health, Yale University, has been nominated by the World Health Organization for the Léon Bernard Foundation prize, established by international subscription in memory of Prof. Léon Bernard of France, a member of the health committee of the League of Nations. The prize, given for practical achievement in social medicine, consists of a medal and 1,000 Swiss francs (about $230).

GEORGIA

State Medical Meeting.—At the annual meeting of the Medical Association of Georgia in Atlanta, May 11-14, under the presidency of Dr. William Farrell Reavis, Dr. R. B. Robins, president of the American Academy of General Practice, Camden, Ark., spoke on "Medicine in This Changing World." Other out-of-state speakers were Drs. David M. Davis, Barton R. Young, and Edward Weiss, Philadelphia; John W. Cline, San Francisco, President of the American Medical Association; Willis J. Potts, Chicago; James T. Priestley, Rochester, Minn.; Robert A. Ross, Durham, N. C.; H. Earle Conwell, Birmingham, Ala.; William L. Wilson, Washington, and Ralph R. Thompsett, New York.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

ILLINOIS

Teaching Prospective Mothers and Fathers.—According to a report by Drs. James B. Gillespie and Thomas R. Wilson of Urbana before the annual meeting of the Illinois State Medical Society, the program for teaching mothers how to care for themselves and their babies is working out well in Champaign and Urbana. The instruction, during the last few weeks of pregnancy, is given in a series of three classes to which the father is also invited. The first class is devoted to obstetrics, and the second and third to pediatrics. In each the physiology, anatomy, and development of the child, the errors to be avoided, and other details are explained. In four years the attendance at such conferences was 3,768, some patients driving as far as 50 miles to attend. After the baby is born the class work is followed up by a nurse who visits the home and gives further instruction.

Chicago

Dr. Rusk to Address Welfare Meeting.—Dr. Howard A. Rusk, chairman, department of physical medicine and rehabilitation, New York Hospital-Bellevue Medical Center, will address the annual meeting of the Health Division of the Welfare Council of Metropolitan Chicago June 9 at noon at the Standard Club.

Society News.—At the annual meeting of the Chicago Ophthalmological Society, April 17, Dr. William F. Hughes Jr. was elected president; Dr. Kenneth L. Roper, vice-president; Dr. Gail R. Soper, secretary-treasurer; Dr. Frank W. Newell, councilor; and Dr. Richard C. Gamble, corresponding secretary.

Solomon Memorial Fund.—The Dr. Jerome D. Solomon Memorial Research Foundation has started a $200,000 fund campaign to continue through November. The foundation, which supports fellows doing research at the Hektoen Institute for Medical Research of the Cook County Hospital, was organized seven years ago in memory of Dr. Solomon, who while serving as a captain in the Army Medical Corps, died in 1944 in Sansapor, Dutch New Guinea.

Scholarship Fund for Medical Librarians.—The Chicago and Vicinity Association of Medical Record Librarians has established the Fae Dillman Memorial Scholarship Fund in honor of the late Mrs. Fae Dillman, who was an assistant medical record librarian at the University of Illinois at the time of her death in April, 1950. Under the provisions of the fund, loans up to $300 per person will be made to students who attend accredited schools for medical record librarians in Chicago. These schools are located at Grant Hospital and at Wesley Memorial Hospital.

INDIANA

University News.—At the annual Alumni Day program at the Indiana University School of Medicine held May 14 under the presidency of Dr. William C. Moore, Muncie, Dr. Dwight H. Murray (class of 1917) Napa, Calif., chairman of the Board of Trustees of the American Medical Association, spoke on "The American Medical Association and the Medical Schools." Dr. Dillon D. Geiger, Bloomington, was installed as president of the Alumni Association for the coming year.——Twenty-two research projects covering a variety of investigations on the medical center campus of the Indiana University School of Medicine, Indianapolis, are now being financed in whole or in part by funds from the James Whitcomb Riley Memorial Association. ——Rolla N. Harger, Ph.D., chairman, department of biochemistry and pharmacology, recently gave a series of four talks on "Alcohol and Safety" at regional meetings of the Shell Oil Company employees in Huntington and Vincennes and in Louisville, Ky.——Dr. W. Foster Montgomery of the department of surgery was a guest lecturer at the International Surgical Seminar on Pediatric Surgery in Madrid, Spain. His lecture was on "Meconium Ileus."

IOWA

Woman of the Year.—Dr. Nelle S. Noble, Des Moines, past president of the American Medical Women's Association, was recently selected by the women's department of the Des Moines Chamber of Commerce as "Woman of the Year." The selection was made on the basis of Dr. Noble's service to the community. Dr. Noble retired in 1949 after practicing for 44 years as a general practitioner. Among her projects were assistance to poor and underprivileged families in Des Moines and nursing homes for sick and elderly persons.

MARYLAND

Blood Center Needs Personnel.—The Baltimore Defense Blood Center of the American National Red Cross, St. Paul and 23rd St., Baltimore 18, announces that it is necessary to increase the medical staff. The salary is $6,600 a year, and the hours are from 9 a. m. to 5 p. m. Monday through Friday. Physicians interested may contact Dr. Courtney W. Shropshire, Medical Director, Baltimore Defense Blood Center, Hopkins 9905.

Personals.—Dr. David Bodian, Baltimore, delivered the annual Don W. Gudakunst Memorial Lecture at the School of Public Health, University of Michigan, May 13 on "The Pathogenesis of Poliomyelitis."——Curt P. Richter, Ph.D., associate professor of psychobiology, Johns Hopkins University School of Medicine, Baltimore, delivered the Menas S. Gregory Lecture on "Stress and Structural Change" May 1 in the Amphitheater, Psychiatric Division, Bellevue Hospital, New York.

MICHIGAN

New Medical Science Building.—The cornerstone for Wayne University's new $4,000,000 medical science building, first unit of a proposed medical center in Detroit, was laid May 9. The "T" shaped structure, with 140,000 sq. ft. of floor space for teaching laboratories, offices and research facilities, will enable Wayne to increase its medical school enrollment by 50%. University officials estimate the building will be ready for use by the freshman class in 1953.

Award of the Howard Ricketts Medal.—Dr. Thomas Francis Jr., chairman of the department of epidemiology, School of Public Health, University of Michigan, Ann Arbor, and director of the U. S. Army Influenza Commission, has been awarded the Howard Ricketts Medal of the University of Chicago. The presentation was made at a University of Chicago scientific meeting in Billings Hospital May 12. Dr. Francis spoke on "The Significance of Variation Among Influenza Viruses" and later was guest of honor at a dinner of the university's division of biological sciences at the Quadrangle Club.

MISSOURI

Narcotic Violation.—Dr. Cecelia King McGill, 305 N. 6th St., St. Joseph, pleaded guilty to an indictment charging violation of U. S. C. Title 26, Section 2554, in the United States District Court at St. Joseph, and on March 17 was sentenced to serve a term of three years.

Dr. E. E. Nelson Joins St. Louis Faculty.—Dr. Erwin Ellis Nelson, medical director and chief of the division of medicine, U. S. Food and Drug Administration, has accepted a position as head of the department of pharmacology at St. Louis University School of Medicine, succeeding Dr. Robert H. K. Foster, who is leaving the university to enter the private practice of medicine.

Dr. Nelson, on leave from the University of Michigan, organized the division of pharmacology in the Food and Drug Administration in 1935. He has been affiliated with the faculties of numerous institutions, including Southern Collegiate Institute, Albion, Ill.; University of Missouri, Columbia; University of Michigan Medical School, Ann Arbor; and Tulane University of Louisiana School of Medicine, New Orleans. He was director of the Wellcome Research Laboratories, Tuckahoe, N. Y., from 1943 to 1947, and from 1947 to the time of his present appointment served in the Food and Drug Administration.

NEBRASKA

Fifty Years in Practice.—During its recent annual session, the Nebraska State Medical Association awarded pins commemorating 50 years of medical practice to the following physicians: Drs. Walter L. Albin of Lincoln, Louis C. Bleick, Daniel T. Quigley, and Philip Sher of Omaha, and John D. Reid of Pilger.

Camp for Diabetic Children.—Springdale Camp, a nonprofit community project to help diabetic children, will be opened June 8-21. The charge is $50 for the two weeks, but funds are available to cover the expenses of children who are unable to pay. This camp was organized and is directed by Nebraska physicians, largely through the diabetic committee of the Nebraska State Medical Association. For information write to Miss Anna Smrha, Department of Health, State Capitol, Lincoln.

NEW JERSEY

Dr. E. C. Kendall Awarded Medal.—At the recent meeting of the Association of American Physicians in Atlantic City, Georgetown University awarded the Kober Medal for 1952 to Edward C. Kendall, Ph.D., co-discoverer of cortisone. Dr. Kendall, of the chemistry department at Princeton University and formerly head of the division of biochemistry at the Mayo Clinic, was a Nobel prize recipient in 1950.

NEW YORK

Meeting of School Physicians.—The annual meeting of the State Association of School Physicians and the State School Nurse-Teachers Association will be held at Lake Placid June 2-3. Dr. Edith G. Mead, Poughkeepsie, is president of the State Association of School Physicians. Dr. George M. Wheatley, of the Metropolitan Life Insurance Company, New York, will speak on "Observations on School Health." The evening program at 8 p. m. will be as follows:

School Cardiac Problems, J. G. Fred Hiss, Syracuse.
Problems of Adolescence, J. Roswell Gallagher, Boston.
Cancer in Childhood, Theodore J. Curphey, Hempstead.

Annual Health Conference at Lake Placid.—The annual health conference of the New York State Department of Health will be held at Lake Placid June 3-6. Dr. Herman E. Hilleboe, state health commissioner, will preside at the opening session. Among the speakers will be Dr. Edward T. Wentworth, president-elect of the Medical Society of the State of New York, and Dr. Gaylord W. Anderson, dean, School of Public Health, University of Minnesota, Minneapolis, and president of the American Public Health Association. Physicians discussing "Child Health," the topic for the second general session, will include Drs. Leona Baumgartner, New York, Harold C. Stuart, Boston, and Mitchell I. Rubin, Buffalo. A discussion on "Chronic Disease" will include Drs. Cassius Van Slyke, Bethesda, Md., Edward M. Holmes Jr., Richmond, Va., and Martin Cherkasky and Donald A. Covalt, New York. The afternoon session will comprise a discussion of vital statistics in public health. Participating in this discussion will be A. Bradford Hill, Ph.D., head of the department of medical statistics, London School of Hygiene and Tropical Medicine, in England, and Dr. Joseph Berkson of the Mayo Clinic, Rochester, Minn. There will be a symposium on the isonicotinic acid derivatives in tuberculosis.

New York City

Gift to Heart Association.—A contribution of $2,500 from the American Trust Company of New York City to initiate a fund to send research investigators of the American Heart Association to the Fourth Inter-American Cardiological Congress at Buenos Aires has been announced by Dr. Irving S. Wright, president of the association. The congress will be held Sept. 1-6 under the auspices of the Argentine Society of Cardiology.

Personals.—Dr. Edward E. Gordon has been named director of medical services at the Institute for the Crippled and Disabled and associate professor of rehabilitation medicine at the Columbia University College of Physicians and Surgeons.——The first award of the New York Academy of Medicine Plaque was made to Dr. Orrin Sage Wightman in recognition of extraordinary service rendered to the academy over a period of many years.

Agencies Unite to Help Disabled.—Columbia University, Presbyterian Hospital, and the Institute for the Crippled and Disabled have undertaken a program of medical care, physical and social readjustment, and job placement of the handicapped, in which resources and facilities of the three groups will be integrated. A department of physical medicine and rehabilitation has been established at Columbia and an independent physical medicine and rehabilitation service at Presbyterian Hospital for the furtherance of this project. The aims of the affiliation are to strengthen the rehabilitation and reeducation programs of the hospital and institute; to give the university divisions opportunities for the study and improvement of methods of rehabilitation; to provide a joint research and instructional program in rehabilitation; to effect a joint program providing all professional services in proper continuity, and to provide for reciprocal interchange of facilities and services.

Vienna Honors Dr. Pick.—At the celebration of his 80th birthday, May 19, the Honorary Doctorate of Medicine was conferred on Dr. Ernest Peter Pick, pioneer researcher in cell chemistry and biology, by the University of Vienna. The American Society of European Chemists, the Medical Circle, and the Rudolf Virchow Medical Society united to honor Dr. Pick on this occasion. Addresses were delivered by Dr. Otto Loewi, Nobel prize winner in chemistry, and Dr. Hans Molitor of Merck Institute. Many former pupils joined with representatives of local and foreign universities to honor Dr. Pick.

OHIO

New Medical Director for Union Health Center.—Dr. John P. Eichhorn, Cleveland, has been appointed the first medical director of the health center of the International Ladies Garment Workers Union in Cleveland. Approximately 5,000 union members employed by contributing firms will receive annual health examinations, including all necessary laboratory work. If further study is needed, patients will be sent to whatever specialists are indicated. Those specialties provided by the health center staff include electrocardiology, allergy, chest medicine, chest surgery, neuropsychiatry, dermatology, ear-nose-throat, general surgery, genitourinary surgery, proctology, gynecology, neurosurgery, ophthalmology, orthopedic surgery, plastic surgery, and dentistry.

OKLAHOMA

Annual State Meeting.—The Oklahoma State Medical Association held its annual meeting May 19-21 in Oklahoma City under the presidency of Dr. L. Chester McHenry. Out-of-state speakers included:

Howard Ulfelder, Boston, Carcinoma of the Cervix.
Charles L. Martin, Dallas, Carcinoma of the Cervix.
Ormond S. Culp, Rochester, Minn., Variations of the Cherney Incision for Improved Exposure of the Lower Abdomen and Urinary Tract.
Lawrence S. Fallis, Detroit, Billroth I. Gastrectomy.
Wallace E. Herrell, Rochester, Minn., Current Trends in Antibiotic Therapy.
J. Edward Berk, Philadelphia, Management of Acute Pancreatitis.
Walter A. Fansler, Minneapolis, Operative Procedures for Carcinoma of the Rectum and Rectosigmoid.
John R. Haserick, Cleveland, Atypical Systemic Lupus Erythematosus.
H. Harland Crank, Houston, Texas, The Psychological Preparation of Patients for Various Medical, Surgical, and Psychiatric Procedures.
J. Mathews Robison, Houston, Texas, Otitis Media with Effusion.
Bruce Chown, Winnipeg, Canada, Clinical and Pathological Observations on Erythroblastosis.

OREGON

Dr. Richardson Goes to New York.—Dr. Howard L. Richardson, assistant professor of pathology, University of Oregon Medical School, Portland, has accepted the position of associate professor of pathology in preventive medicine in the Sloan-Kettering Division of the Cornell University Medical College, New York. Dr. Richardson, who will be director of the cytology laboratory of the Strang Cancer Prevention Clinic, will work in cooperation with Dr. Cornelius P. Rhoads, director of the Memorial Center for Cancer and Allied Diseases, New York.

PENNSYLVANIA

Society News.—Dr. Louis H. Clerf, professor of laryngology and bronchoesophagology, Jefferson Medical College, Philadelphia, recently lectured on "Laryngeal Lesions of Epithelial Origin" before the Reading Eye, Ear, Nose, and Throat Society.

Sharp Decline in Syphilis.—Dr. Norman R. Ingraham of Philadelphia, chairman of the Commission on Control of Syphilis and Venereal Diseases of the Medical Society of the State of Pennsylvania, reports an 85% reduction in the number of cases of infectious syphilis in Pennsylvania, from 4,368 in 1947 to 648 last year. Cases of all types of syphilis reported last year were the lowest in the past 10 years. Syphilis in the newborn showed a reduction from 860 cases in 1941 to 287 last year. "The relatively sharp decline in infectious syphilis indicates an absolute decline of the incidence of syphilis in the general population of the Commonwealth," Dr. Ingraham declared.

Philadelphia

Bequest to Woman's Medical College.—Under the will of the late Dr. Sara J. Ware of the class of 1890, the Woman's Medical College of Pennsylvania is beneficiary of $15,000. The sum of $7,500 is to be used for the support and maintenance of the college in memory of Dr. Ware's brother, George Melville Williams.

Lectures on Medieval Science.—George Sarton, Sc.D., emeritus professor of the history of science at Harvard University, who was recently appointed the A. S. W. Rosenbach Fellow in Bibliography at the University of Pennsylvania, will deliver a series of three lectures on "Appreciation of Ancient and Medieval Science in the Renaissance." The first lecture, October 17, will be devoted to medicine.

SOUTH CAROLINA

Short Course in Electrocardiography.—The Greenville General Hospital will hold a course on electrocardiography June 13-14. The lectures and demonstrations will be conducted by Dr. J. Willis Hurst of the department of cardiology at Emory University School of Medicine, Atlanta. A fee of $10 will be charged.

TEXAS

State Medical Election.—At the annual meeting of the Texas Medical Association in Dallas May 4-7, Dr. Truman C. Terrell of Fort Worth was elected president; Dr. George Turner of El Paso, president-elect; and Dr. Wayne V. Ramsey of Abilene, vice-president. Drs. Samuel N. Key of Austin and Thomas H. Thomason of Fort Worth continue in office as secretary and treasurer, respectively.

VERMONT

Annual Lecture in Memory of Dr. Hamilton.—The American Psychopathological Association is establishing an annual memorial lecture in honor of the late Dr. Samuel Warren Hamilton, Burlington, Vt., to be known as the Samuel W. Hamilton Memorial Lecture Award. Contributions to the fund should be mailed to Dr. William B. Terhune at New Canaan, Conn., chairman of the fund-raising committee.

VIRGINIA

University Retirements.—William Parker Anslow, Ph.D., associate professor of physiology at New York University College of Medicine, has been appointed professor of physiology and chairman of the School of Physiology of the University of Virginia Department of Medicine, Charlottesville. He will succeed Dr. Sydney W. Britton who will retire in June.——Dr. William Edward Bray, professor of clinical pathology and director of the clinical laboratories, University of Virginia Department of Medicine, Charlottesville, will retire in July. Dr. Bray, founder of the clinical laboratories and of a school for medical technologists at the University of Virginia, and author of "Clinical Laboratory Methods," has served the department of medicine for 39 years.

GENERAL

New Headquarters for Academy of Pediatrics.—The central office of the American Academy of Pediatrics has been moved to 610 Church St., Evanston, Ill. The new offices, half a block from the old headquarters, provide more space and better facilities to meet the growing needs of the academy.

Historians Elect Officers.—At its annual meeting in Kansas City, Kan., May 1-3, the American Association of the History of Medicine elected Dr. John F. Fulton, New Haven, Conn., president; Dr. George W. Corner, Baltimore, vice-president; Dr. Samuel X. Radbill, Philadelphia, secretary; and Dr. Emerson C. Kelly, Albany, treasurer.

Meeting on Civil Defense.—At a program on civil defense June 16 at the Biennial Nursing Convention in Convention Hall, Atlantic City, Dr. Norvin C. Kiefer, Washington, D. C., director of the Federal Health and Special Weapons Defense Division, and Mrs. Frances C. Nabbe, R.N., consultant, Nursing Health and Special Weapons Defense Division, will discuss "Plans of the Health and Special Weapons Defense Division of the Federal Civil Defense Administration."

Annual Bronchoesophageal Meeting.—The American Broncho-Esophagological Association held its annual meeting May 20-21 at the Royal York Hotel, Toronto, Canada, under the presidency of Dr. Herman J. Moersch, Rochester, Minn. Invited speakers included: Drs. G. Arnold Henry, Toronto, Canada; Walter F. Lever, Boston; James H. Walker and Herbert J. Dietrich Jr., Brookline, Mass.; Victor Parchet, Basel, Switzerland, and Alexander H. Beaton, Rochester, N. Y.

Home Study Courses.—The 1952-1953 Home Study Courses in the basic sciences related to ophthalmology and otolaryngology, offered as part of the educational program of the American Academy of Ophthalmology and Otolaryngology, will begin on Sept. 1 and continue for 10 months. Information can be secured from Dr. William L. Benedict, executive secretary-treasurer of the academy, 100 First Avenue Building, Rochester, Minn. Registrations should be completed before Aug. 15.

Dr. Lawrence to Retire September 1.—Dr. Joseph S. Lawrence, director of the A. M. A. Washington Office since 1944, will retire Sept. 1. His successor will be the present Deputy Director, Dr. Frank E. Wilson. Many of Dr. Lawrence's friends are planning a subscription luncheon for him on Sunday, June 8, in Chicago, the day before the annual meeting of the American Medical Association opens officially. Anyone desiring reservations for the luncheon may contact the office of the Secretary and General Manager, Dr. George F. Lull, 535 N. Dearborn St., Chicago.

Medicinal Chemistry Symposium.—The Third National Medicinal Chemistry Symposium will be sponsored by the American Chemical Society's Division of Medicinal Chemistry at the University of Virginia June 12-14. Recent progress in the chemical study of hardening of the arteries, new observations on the influenza virus, and the latest developments in the chemistry of cortisone and corticotropin will be discussed. "The Mechanism of Drug Action" is the subject of a roundtable discussion on Thursday evening, with Dr. Arthur P. Richardson of Emory University, Atlanta, as moderator. Leon A. Sweet, Ph.D., of Detroit, director of chemical research and products development of Parke, Davis & Company, will speak on "The Roles of Industry, Universities and Government in Medical Research" at a dinner Friday night.

American Urological Association.—The American Urological Association will hold its annual meeting at the Chalfonte-Haddon Hall in Atlantic City, N. J., June 23-26 under the presidency of Dr. Elmer Hess of Erie, Pa. Twenty-two motion pictures will be shown, and 31 papers will be presented. The papers will include prize-winning essays read by invitation by Drs. Milton L. Rosenberg, San Francisco (first prize); Robert A. Kelley, Charlottesville, Va. (second prize); Johan N. deKlerk, Baltimore (third prize); and Alex L. Finkle, New York (honorable mention). On Wednesday afternoon, following the presidential address on "What of the Future?" the Ramon Guiteras Lecture, "Endocrine Factors in Cancer," will be presented by Dr. Charles B. Huggins, professor of urology and director of the Ben May Laboratory for Cancer Research, University of Chicago. The banquet at 8 p. m. that evening will be preceded by the president's cocktail party at 6:45.

On Thursday morning Dr. Charles C. Higgins, Cleveland, will serve as moderator for a panel discussion on "Carcinoma of the Bladder." Collaborators will be Drs. Hugh J. Jewett, Baltimore, William A. Milner, Albany, Fathollah K. Mostofi, Washington, D. C., and Vincent J. O'Conor, Chicago.

The seventh annual award for research on the male reproductive tract will be presented Thursday afternoon to Warren O. Nelson, Ph.D., professor of anatomy, State University of Iowa College of Medicine, Iowa City. Dr. Nelson will speak on "Problems of Testicular Function."

American Medical Women's Association.—The American Medical Women's Association will hold its annual meeting June 7-9 with headquarters at the Blackstone Hotel, Chicago. There will be two banquets, the first on Sunday at 7 p. m. when the Woolley Memorial Lecture will be given by Dr. Evelyn M. Anderson of Washington, D. C., on "The Brain Is the Regulator of Metabolism." On Monday Dr. Evangeline E. Stenhouse of Chicago, who will be installed as president at the inaugural banquet, will speak on "Women: Patients and Physicians." A social program extending beyond the convention dates will include a boat trip Monday afternoon, a tour of Armour Laboratories Tuesday afternoon, and luncheon in the garden at the Chicago Art Institute, 12:30 p. m. Wednesday, with a tour through the institute. Luncheon charge is $2.50. Reservations are requested for the social events. On Thursday from 10 a. m. to 5 p. m. there will be open house at Dr. Margaret Austin's cardiac kitchen at the Women and Children's Hospital. During the A. M. A. convention a lounge will be available for the use of all medical women at the Navy Pier where the exhibits and general meetings will be held. This lounge is located on the third floor of the University of Illinois section.

Genitourinary Surgeons Convene.—The American Association of Genito-Urinary Surgeons will hold its annual meeting June 19-21 at the Seaview Country Club, Absecon, N. J., under the presidency of Dr. Charles C. Higgins of Cleveland. On Thursday morning the following symposium on pyelograms will be presented:

Unusual Pyelograms in Adults, Gershom J. Thompson, Rochester, Minn.
Ureterograms, Thomas D. Moore, Memphis.
Urograms in Children, Edgar Burns, New Orleans.
Pyelograms of Renal Displacement, William J. Engel, Cleveland.
Bladder Cystograms, Austin I. Dodson, Richmond, Va.

A symposium on the adrenal glands will be held Friday morning. Presentations will be as follows:

Bilateral Adrenalectomy for Carcinoma of the Prostate, William J. Baker, Chicago.
Further Observations of Bilateral Total Adrenalectomy in Man, J. Hartwell Harrison, George W. Thorn, and H. Dalton Jenkins, Boston.
Adrenalectomy for Tumors of the Adrenal Gland, George F. Cahill, New York.
Surgery of the Adrenal Gland for Cushing's Syndrome, Charles C. Higgins and Eugene F. Poutasse, Cleveland.
The Endocrine Management of Disseminated Prostatic Cancer, Including Bilateral Adrenalectomy and Hypophysectomy, William Wallace Scott, Baltimore.
Pre- and Post-Operative Care of Patient Undergoing Adrenalectomy, Joseph W. Jailer, New York.
Experiences with Bilateral Adrenalectomy and Cortisone Therapy in the Treatment of Advanced Cancer of the Prostate, Wyland F. Leadbetter, Emil J. Ganem, and David H. Solomon, Boston.

Society Elections.—At the annual meeting of the American Dermatological Association in Colorado Springs, Colo., April 23-26, Dr. Earl D. Osborne of Buffalo was elected president; Dr. Paul E. Bechet of Elizabeth, N. J., vice-president; and Dr. Frank C. Combes of New York, treasurer. Dr. Louis A. Brunsting of Rochester, Minn., was reelected secretary.——At the annual business meeting of the American Psychosomatic Society in Chicago, March 29, Dr. Sydney G. Margolin of New York was elected president, Dr. George L. Engel of Rochester, N. Y., president-elect, and Dr. Fredrick C. Redlich of New Haven, Conn., secretary-treasurer.——At the annual meeting of the American College of Physicians in Cleveland, April 21-25, Dr. T. Grier Miller of Philadelphia was inducted as president and Dr. LeRoy H. Sloan of Chicago, professor of medicine at the University of Illinois College of Medicine, was chosen president-

elect.——At the annual meeting of the southeastern section of the American Urological Association April 5, Dr. William R. Miner of Covington, Ky., was installed as president. Dr. Russell B. Carson of Fort Lauderdale, Fla., was named president-elect, and Dr. Sidney Smith of Raleigh, N. C., secretary-treasurer. The next meeting of the southeastern section will be held at the Hotel de Nacional, Havana, Cuba, March 26-29, 1953.——At its annual meeting at Old Point Comfort, Va., May 5-7, the Society for Pediatric Research elected Dr. Robert Ward, New York, president; Dr. Milton Rapoport, Philadelphia, vice-president; and Dr. Sydney S. Gellis, Boston, secretary-treasurer.

Nursing Profession Plans to Reorganize.—The nursing profession expects to have a new national organizational structure before next fall. Instead of the six national organizations that are now concerned with professional nursing, there probably will be only two—the American Nurses' Association and the National League for Nursing.

The first definite step in planning for reorganization was taken in 1944, when the boards of directors of the American Nurses' Association, the National League of Nursing Education, and the National Organization for Public Health Nursing voted to undertake a joint survey of their "organization structure, administration, functions, and facilities to determine whether a more effective means can be found to promote and carry forward the strongest possible program for professional nursing and nurses."

During 1945, the Association of Collegiate Schools of Nursing, the American Association of Industrial Nurses, and the National Association of Colored Graduate Nurses joined in the reorganization study. In 1950, the six participating groups voted to realine into two organizations. They asked national committees to work out the details of a plan so that it would be ready for action by the members during the summer of 1952. It was understood that one of the organizations would be the American Nurses' Association and that it would continue to be an all-professional nurse organization exclusively for professional nurses. The other was to be a new organization for all those interested in improving nursing services and education—nurses and non-nurses alike. In the new two organization plan, the American Nurses' Association will promote the professional, general, and economic welfare of professional nurses and help them become the best possible practitioners as individuals and as members of a profession.

"National League for Nursing" is the name being proposed for the new national nursing organization. When the members take necessary action, it will replace and carry forward the major programs of four of the present groups: the American Association of Industrial Nurses, the Association of Collegiate Schools of Nursing, the National League of Nursing Education, and the National Organization for Public Health Nursing. In addition, the National League for Nursing will assume responsibility for activities in nursing never before fully developed.

Both the American Nurses' Association and the National League for Nursing will have state and local or district units. The American Nurses' Association will continue to be a federation of state nurses' associations. Most of these state associations are divided into districts so that members may carry forward a well developed and direct program in addition to state and national programs.

The National League for Nursing, too, will have constituent units in the states, and a State League for Nursing will have district units. It is intended that, when the members take necessary action, a State League for Nursing will take the place of any and all of the following groups that may now be organized in a state: State League of Nursing Education, State Organization for Public Health Nursing, State Association of Industrial Nurses, and a State Committee on the Improvement of Nursing Services (The Association of Collegiate Schools of Nursing does not have state units).

Realinement of the national nursing organizations will make it possible for nursing to achieve close coordination of effort and at the same time preserve the diversity that stimulates the growth of various phases of nursing. Through a two organization structure, nurses, members of allied professional groups, and other citizens will be able to work together more effectively toward a common goal—better nursing care for the public.

FOREIGN

German Neurology Meeting.—The German Society for Neurology, jointly with the German Society for Physiological Chemistry and the German Society for Neurosurgery, will hold its annual meeting in Hamburg, Sept. 25-27. Among the subjects to be discussed are metabolism, permeability of the nervous system, edema, aneurysms, and angiomas of the brain. For information, write to the Secretary of the German Society of Neurology, Prof. G. Döring, Krankenhaus Heidberg, Hamburg-La 2.

CORRECTION

Cold Sterilization of Instruments.—In the discussion of cold sterilization of instruments in Queries and Minor Notes, THE JOURNAL, April 19, 1952, page 1458, the last paragraph does not indicate clearly that the formula of a noncorrosive formaldehyde solution, which is cited as an example, is the formula for a vehicle in which formaldehyde is later dissolved. Formaldehyde solutions prepared with this vehicle may be any of several strengths, but a 1% solution is commonest for cold sterilization.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II*, June 18-20; *Part I*, September. All centers where there are five or more candidates. Exec. Sec., Dr. John P. Hubbard, 225 S. 15th St., Philadelphia 2.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral.* Swampscott, Mass., Sept. 28-Oct. 1. Sec., Dr. C. B. Hickcox, 80 Seymour St., Hartford 15.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various centers and overseas, Oct. 20. Closing date for the acceptance of applications for the written examination was May 1. *Oral.* Chicago, June 5-7, San Francisco, September or October; New York City, November or December. Subspecialty: Gastroenterology. *Examination.* Chicago, June 7. Exec. Sec.-Treas., Dr. William A. Werrell, 1 West Main Street, Madison 3.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Oral.* Chicago, June 7-13, 1952. Final date for filing application was Feb. 1, 1952. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

AMERICAN BOARD OF OPHTHALMOLOGY: *Practical.* Chicago, Oct. 6-10 and New York City, June 6-10, 1953. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: The deadline for the receipt of applications for the 1953 Part II examinations is Aug. 15. Sec., Dr. Harold A. Sofield, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY. *Oral.* Chicago, Oct. 6-10. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

AMERICAN BOARD OF PEDIATRICS: *Oral.* San Francisco, June 27-29; Chicago, Oct. 24-26; Boston, late November. Exec. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION: *Parts I and II.* Chicago. June 8 and 9. Sec., Dr. Robert L. Bennett, Georgia Warm Springs Foundation, Warm Springs, Ga.

AMERICAN BOARD OF PREVENTIVE MEDICINE AND PUBLIC HEALTH: Cleveland, Oct. 18-20. Sec., Dr. E. L. Stebbins, 615 N. Wolfe St., Baltimore.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Chicago, June 13-14. Final date for filing applications was March 15. New York City, Dec. 15-16. Final date for filing applications is Sept. 15. Sec.-Treas., Dr. David A. Boyd, Jr., 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Dec. 1-7. Final date for filing application is June 1. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Various Centers. October 1952. Final date for filing application is July 1. Sec., Dr. J. Stewart Rodman, 225 15th St., Philadelphia.

MEETINGS

American Medical Association, Chicago, June 9-13. Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

American Academy of Tuberculosis Physicians, Chicago, June 7. Dr. Oscar S. Levin, P. O. Box 7011, Denver, Secretary.

American Association for the Study of Neoplastic Diseases, St. Agnes Hospital, Baltimore, June 5-7. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N.W., Washington, D. C., Secretary.

American Association of Genito-Urinary Surgeons, Seaview Country Club, Absecon, N. J., June 19-21. Dr. Norris J. Heckel, 122 South Michigan Ave., Chicago 3, Secretary.

American Association on Mental Deficiency, Hotel Bellevue-Stratford, Philadelphia, May 26-31. Dr. Neil A. Dayton, P. O. Box 96, Willimantic, Conn., Secretary.

American Blood Irradiation Society, Conrad Hilton Hotel, Chicago, June 7-8. Dr. H. T. Lewis, 5230 Center Ave., Pittsburgh, Secretary.

American College of Chest Physicians, Congress Hotel, Chicago, June 5-8. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago, Executive Secretary.

American Diabetes Association, Drake Hotel, Chicago, June 7-8. Dr. J. A. Reed, 11 West 42d St., New York 36, Secretary.

American Geriatrics Society, Hotel LaSalle, Chicago, June 5-7. Dr. Malford W. Thewlis, 25 Mechanic St., Wakefield, R. I., Secretary.

American Hearing Society, Chicago, June 28. Mrs. Francis E. Lee, 817 14th St. N.W., Washington 5, D. C., Secretary.

American Medical Women's Association, Chicago, June 8. Dr. Lucille Marsh, 1168 Briarcliff Road, N.E., Atlanta, Ga., Corresponding Secretary.

American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. Maynard C. Wheeler, 30 West 59th St., New York 19, Secretary.

American Orthopedic Association, London, England, June 30-July 4. Dr. C. Leslie Mitchell, Henry Ford Hospital, Detroit 2, Secretary.

American Proctologic Society, Milwaukee, June 4-7. Dr. Stuart T. Ross, 131 Fulton Ave., Hempstead, L. I., N. Y., Secretary.

American Radium Society, Chicago, June 8. Dr. John Wirth, 635 Herkimer St., Pasadena 1, Calif., Secretary.

American Rheumatism Association, Conrad Hilton Hotel, Chicago, June 6-7. Dr. William H. Kammerer, 33 East 61st St., New York 21, Secretary.

American Society for the Study of Sterility, Chicago, June 7-8. Dr. Walter W. Williams, 20 Magnolia Terrace, Springfield 8, Mass., Secretary.

American Therapeutic Society, Blackstone Hotel, Chicago, June 5-8. Dr. Oscar B. Hunter Jr., 915 Nineteenth St. N.W., Washington 6, D. C., Secretary.

American Trudeau Society, Hotel Statler, Boston, May 26. Dr. John D. Steele, 1790 Broadway, New York 19, Secretary.

American Urological Association, Chalfonte-Haddon Hall, Atlantic City, N. J., June 23-26. Dr. Charles H. deT. Shivers, Boardwalk National Arcade Bldg., Atlantic City, N. J., Secretary.

American Veterinary Medical Association, Ambassador Hotel, Atlantic City, N. J., June 23-26. Dr. J. C. Hardenbergh, 600 South Michigan Ave., Chicago 5, Executive Secretary.

Catholic Hospital Association of the United States and Canada, Cleveland, May 26-29. Rev. John J. Flanagan, S.J., 1438 South Grand Blvd., St. Louis 4, Director.

Idaho State Medical Association, Sun Valley, June 15-18. Dr. Robert S. McKeon, 305 Sun Bldg., Boise, Secretary.

Maine Medical Association, Samoset Hotel, Rockland, June 22-24. Mr. W. Mayo Payson, 142 High Street, Portland 3, Executive Secretary.

Medical Library Association, Lake Placid Club, Lake Placid, N. Y., June 24-27. Miss Caroline Riechers, 1758 West Harrison St., Chicago 12, Secretary.

Minnesota State Medical Association, Minneapolis, May 26-28. Dr. B. B. Souster, 496 Lowry Medical Arts Bldg., St. Paul 2, Secretary.

National Tuberculosis Association, Copley Plaza and Statler Hotels, Boston, May 26-30. Mr. Kemp D. Battle, 1790 Broadway, New York 19, Secretary.

North American Chapter, International Society of Angiology, Conrad Hilton Hotel, Chicago, June 7. Dr. Henry Haimovici, 105 East 90th St., New York 28, Secretary.

Post Graduate Medical Assembly of South Texas, Shamrock Hotel, Houston, July 21-23. Dr. C. A. Dwyer, 229 Medical Arts Bldg., Houston, Secretary.

Society for Investigative Dermatology, Hotel Sherman, Chicago, June 7-8. Dr. Herman Beerman, 255 South 17th St., Philadelphia 3, Secretary.

Society for Vascular Surgery, Chicago, June 8, Dr. George D. Lilly, 331 Ingraham Bldg., Miami 32, Fla., Secretary.

The Endocrine Society, Palmer House, Chicago, June 5-7. Dr. Henry H. Turner, 1200 North Walker St., Oklahoma City 3, Secretary.

Upper Peninsula Medical Society, Country Club, Iron Mountain, Mich., June 27-28. Dr. E. Theodore Palm, 412 Superior Ave., Crystal Falls, Mich., Secretary.

West Virginia State Medical Association, The Greenbrier, White Sulphur Springs, July 24-26. Mr. Charles Lively, P. O. Box 1031, Charleston, Executive Secretary.

Wyoming State Medical Society, Nobel Hotel, Lander, June 5-7. Dr. Glenn W. Koford, 2020 Carey Ave., Cheyenne, Secretary.

INTERNATIONAL

Australasian Medical Congress, Melbourne Victoria, Australia, Aug. 22-30. Dr. C. H. Dickson, Medical Society Hall, 426 Albert St., East Melbourne, Victoria, Australia, General Secretary.

Commonwealth and Empire Health and Tuberculosis Conference, Central Hall, London, England, July 8-13. Dr. J. H. Harley Williams, Tavistock House North, Tavistock Sq., London, W.C.1, England, Secretary General.

Congress of the International Diabetes Federation, Leyden, Netherlands, July 7-12. Dr. F. Gerritzen, 33, Prinsegracht, The Hague, Netherlands, Secretary.

European Congress of Cardiology. University of London, Bloomsbury, W.C.1, England, Sept. 10-12. Dr. K. Shirley Smith, 35 Wimpole St., London, W.1, England, Secretary.

European Society of Cardiovascular Surgery, Strasbourg, France, Oct. 3-4. Sir James Learmonth, Department of Surgery, University New Buildings, Edinburgh 8, Scotland.

Interamerican Cardiological Congress, Buenos Aires, Argentina, Aug. 31-Sept. 7. Dr. Blas Moia, Larrea 1132, Buenos Aires, Argentina, Secretary-General.

Inter-American Congress of Public Health, Havana, Cuba, Sept. 27-Oct. 1. Pan-American Sanitary Bureau, 2001 Connecticut Ave., Washington, D. C.

Inter-American Congress of Radiology, Mexico City, Mexico, Nov. 2-8. Dr. Guido Torres Martinez, Marsella No. 11, Mexico, D.F., Secretary-General.

International Congress of Biochemistry, Paris, France, July 21-27. Prof. Jean Courtois, 4, Avenue de l'Observatoire, Paris 6°, France, Secretary.

International Congress of Dermatology and Syphilology, London, England, July 21-26. Dr. Gordon B. Mitchell-Heggs, 5, Lisle St., London, W.C.2, England, General Secretary.

International Congress of Dietetics, Royal Tropical Institute, Amsterdam, The Netherlands, July 7-11. Miss Diane J. Ten Haaf, Educational Bureau of the Nutritional Council, 42 Koninginnegracht, The Hague, Netherlands, General Secretary.

International Congress on Diseases of the Chest, Rio de Janeiro, Brazil, Aug. 24-30. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Illinois, Executive Secretary.

International Congress of Haematology, Mar del Plata, Argentina, Sept. 21-26. Dr. Carlos Reussi, Anchorena 1710, Buenos Aires, Argentina, Secretary.

International Congress of Health Technicians, Palais de la Mutualite, Paris, France, June 9-14. Secretariat General, 6 Square Desaix, Paris XV°, France.

International Congress of the History of Medicine, Nice-Cannes, France, and Monaco, Sept. 8-18. Dr. F. A. Sondervorst, 124 Avenue des Allies, Louvain, Belgium, Secretary-General.

International Congress on Hydatid Disease, Santiago, Chile, Nov. 21-24. Organizing Committee, P. O. Box 9183, Santiago, Chile.

International Congress of Internal Medicine, Friends House, London, N.W.1, Eng. Sept. 15-18. Sir Harold Boldero, 12 Pall Mall East, London, S.W.1, England, Secretary.

International Congress on Medical Records, London, England, Sept. 7-12. Miss Gwen Perkins, 120 C Street S.E., Washington, D. C., Chairman.

International Congress of Medicine and Sport, Paris, France. May 29-June 1. Prof. Chailley-Bert, 1 rue Lacretelle, Paris 15°, France, Chairman.

International Congress on Neuropathology, Rome, Italy, Sept. 8-13. Dr. Armando Ferraro, 722 W. 168th St., New York, N. Y., U. S. A., Secretary General.

International Congress of Physical Medicine, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Hon. Secretary.

International Congress of Physiopathology of Animal Reproduction and Artificial Insemination, Copenhagen, Denmark, July 7-10. Prof. Ed. Sorensen, The Royal Veterinary and Agricultural College, Bülowsvej 13, Copenhagen V, Denmark.

International Congress of Urology, The Waldorf-Astoria, New York, N. Y., U. S. A., Sept. 15-18. Dr. John A. Taylor, 2 East 54th St., New York, N. Y., U. S. A., Secretary-General.

International Society of Geographic Pathology, Liège, Belgium, July 15-18. Dr. Fred C. Roulet, Habelstr. 24, Basel, Switzerland, Secretary General.

International Union Against Tuberculosis, Rio de Janeiro, Brazil, Aug. 24-27. Prof. Etienne Bernard, 66 Blvd. St. Michel, Paris 6e, France, Secretary-General.

Neuroradiologic Symposium, Stockholm, Sweden, Sept. 17-20. Docent Ake Lindbom, Symposium Neuroradiologicum, Serafimerlasarettet, Stockholm K., Sweden, Secretary.

World Medical Association, Athens, Greece, Oct. 12-16. Dr. Louis H. Bauer, 2 East 103d St., New York 29, N. Y., Secretary General.

DEATHS

Gottlieb, Julius ⊕ Lewiston, Maine; born in Jerusalem, Jan. 2, 1896; Boston University School of Medicine, 1924; specialist certified by the American Board of Pathology; certified by the National Board of Medical Examiners; member of the College of American Pathologists; fellow of the American College of Physicians; in 1933 elected chairman of the Maine State Cancer Committee; assistant professor of postgraduate pathology and bacteriology at Tufts College Medical School; instructor in bacteriology and pathology, Boston University School of Medicine, from 1927 to 1935; professor of bacteriology at Colby College; affiliated with Augusta (Me.) General Hospital, Bath (Me.) Memorial Hospital, Brunswick (Me.) Hospital, Camden (Me.) Community Hospital, Franklin County Memorial Hospital in Farmington, Henrietta D. Goodall Hospital in Sanford, Gardiner (Me.) General Hospital, Knox County General Hospital in Rockland, Miles Memorial Hospital in Damariscotta, Redington Memorial Hospital, Skowhegan, Rumford (Me.) Community Hospital, St. Andrews Hospital in Boothbay Harbor, Sisters' Hospital and Thayer Hospital in Waterville and the Central Maine General Hospital; surgeon in the U. S. Public Health Service Reserve; associate editor of the *Maine Medical Journal;* died Feb. 17, aged 56, of coronary heart disease.

Marshall, George Guerin ⊕ Rutland, Vt.; born Sept. 18, 1867; University of Vermont College of Medicine, Burlington, 1893; specialist certified by the American Board of Ophthalmology; member of the House of Delegates of the American Medical Association in 1946; member of the American Academy of Ophthalmology and Otolaryngology; past president of the Rutland County Medical Society and Vermont State Medical Society; fellow of the American College of Surgeons; served during World War I; at one time member of the school board; formerly on the staff of Proctor Hospital in Proctor, Springfield Hospital in Springfield and Rutland Hospital; died March 1, aged 84, of coronary insufficiency.

Stone, Theodore Thaddeus ⊕ Chicago; born in Chicago Aug. 3, 1897; University of Illinois College of Medicine, Chicago, 1920; professor of nervous and mental diseases at Northwestern University Medical School; specialist certified by the American Board of Psychiatry and Neurology; member of the American Neurological Association, American Association of Neuropathologists, Association for Research in Nervous and Mental Diseases and Central Neuropsychiatric Association; fellow of the American College of Physicians; chairman of division of neurology and psychiatry and attending neurologist, Wesley Memorial Hospital; died in Woodstock, Ill., March 5, aged 54, of tuberculosis of the bladder.

Cox, Gerard Hutchison, Saranac Lake, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1903; specialist certified by the American Board of Otolaryngology and the American Board of Plastic Surgery; member of the American Otological Society; fellow of the American College of Surgeons; an Associate Fellow of the American Medical Association; consulting plastic surgeon, North Country Community Hospital in Glen Cove and the Meadowbrook Hospital in Hempstead; consulting otolaryngologist for the Veterans Administration Hospital at Sunmount and the Mercy Hospital in Tupper Lake; died recently, aged 74, of carcinoma.

Frick, John Howard ⊕ Philadelphia; Temple University School of Medicine, Philadelphia, 1912; served on the faculty of his alma mater, where he had been a trustee; member of the founders group of the American Board of Surgery; fellow of the American College of Surgeons; consulting surgeon, Eastern State Penitentiary; on the courtesy staff, Hospital of the Woman's Medical College of Pennsylvania and St. Luke's and Children's Medical Center; past president of the General Alumni Association at Temple University; died in Frankford Hospital Feb. 27, aged 66, of cerebral hemorrhage.

⊕ Indicates Fellow of the American Medical Association.

Blanton, Joseph Clary, Richmond, Va.; Medical College of Virginia, Richmond, 1900; member of the American Medical Association; died recently, aged 83, of carcinoma of the prostate.

Cochran, Robert Henry ⊕ Coleman, Texas; Atlanta College of Physicians and Surgeons, 1902; served overseas during World War I; on the staff of the Overall Memorial Hospital, where he died Feb. 24, aged 75.

Cox, Seth Leroy ⊕ Seattle; Jefferson Medical College of Philadelphia, 1912; member of the Kansas Medical Society, American College of Chest Physicians and the American Trudeau Society; for many years executive secretary of the Kansas Tuberculosis and Health Association; served during World War I; died Feb. 26, aged 70, of heart disease.

Cundiff, Walter Roscoe, Somerset, Ky.; Hospital College of Medicine, Louisville, Ky., 1907; past president of the Pulaski County Medical Society; served on the staff of the Somerset City Hospital, where he died Feb. 15, aged 82, of coronary thrombosis.

Darst, Robert Edward, Chicago; Northwestern University Medical School, Chicago, 1951; resident physician at Wesley Memorial Hospital; died Feb. 29, aged 27.

Davis, Henry Clarke ⊕ San Francisco; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1911; served overseas during World War I; died in Boyes Hot Springs, Calif., Feb. 28, aged 64.

Dibrell, John Raleigh ⊕ Little Rock, Ark.; University of Arkansas School of Medicine, Little Rock, 1900; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; past president of the state and city boards of health; served on the staffs of St. Vincent Infirmary and Arkansas Baptist Hospital; died Feb. 24, aged 74, of cerebral hemorrhage.

Doty, Roy A., Rogersville, Tenn.; Lincoln Memorial University Medical Department, Knoxville, 1913; member of the American Medical Association; died in Greeneville Feb. 19, aged 67.

Eshbaugh, Walter S., Marengo, Ill.; the Hahnemann Medical College and Hospital, Chicago, 1881; for many years deputy coroner of McHenry County and health officer of Marengo; died in St. Joseph's Hospital, Belvidere, Jan. 29, aged 95.

Evans, Emery Ericson, St. Louis; Beaumont Hospital Medical College, St. Louis, 1901; member of the American Medical Association; died Feb. 28, aged 76, of coronary occlusion.

Frank, Morris Samuel ⊕ Bayonne, N. J.; Cornell University Medical College, New York, 1909; fellow of the International College of Surgeons; served on the staffs of the Margaret Hague Maternity Hospital in Jersey City and Bayonne Hospital; died Jan. 1, aged 65, of arteriosclerotic heart disease.

Grant, Stephen Hunter ⊕ Deport, Texas; University of Texas School of Medicine, Galveston, 1903; president of the Lamar County Medical Society; member of the American Academy of General Practice; died recently, aged 72, of coronary occlusion.

Gray, George Henry, Hyannis, Mass.; University of Vermont College of Medicine, Burlington, 1888; member of the American Medical Association and the New England Surgical Society; fellow of the American College of Surgeons; past president of the Essex County Medical Society; served during World War I; consulting surgeon at the Cape Cod Hospital, where he had been director and chief surgeon for many years; died Feb. 19, aged 88, of arteriosclerosis.

Grayston, Fred W., Huntington, Ind.; College of Physicians and Surgeons of Chicago, 1895; member of the American Medical Association; health commissioner of Huntington County; past president of the Huntington County Medical Society; died Feb. 20, aged 81, of chronic myocarditis.

Ice, Noel Carlysle, McAllen, Texas; Western Reserve University School of Medicine, Cleveland, 1917; member of the American Medical Association; affiliated with McAllen Municipal Hospital; died Feb. 6, aged 62, of acute pulmonary edema and rheumatic heart disease.

Johnston, Milton L., Harrod, Ohio; Eclectic Medical Institute, Cincinnati, 1885; died Dec. 23, aged 90.

McGavin, Jessie M., Portland, Ore.; Northwestern University Woman's Medical School, Chicago, 1896; member of the American Medical Association; served on the staff of the Multnomah County Hospital; died Feb. 27.

Neely, Augustus Theodore, Newberry, S. C.; Medical College of the State of South Carolina, Charleston, 1913; died in Baptist Hospital, Columbia, Feb. 1, aged 64.

Norton, William Harrison, Mount Rainier, Md.; George Washington University School of Medicine, Washington, D. C., 1916; also a graduate in pharmacy; served during World War I; member of the American Medical Association; affiliated with Prince George's General Hospital in Cheverly, Md., George Washington University Hospital in Washington, D. C., and the Sibley Memorial Hospital in Washington, D. C., where he died Feb. 28, aged 64, of coronary thrombosis.

Owen, Samuel Henry Clay, Detroit; Meharry Medical College, Nashville, Tenn., 1917; on the staff of the Parkside Hospital; died recently, aged 60, of coronary occlusion.

Owens, Maurice E. Broadas, Richmond, Va.; University of Maryland School of Medicine, Baltimore, 1910; died recently, aged 67, of bronchopneumonia and hypertensive cardiorenal disease.

St. Benno, Richard, Glen Ellyn, Ill.; College of Medicine and Surgery (Physio-Medical) Chicago, 1905; died recently, aged 93, of malnutrition.

Sarven, James David, Cleveland; University of Illinois College of Medicine, Chicago, 1927; died suddenly in Tampa, Fla., Feb. 18, aged 57, of coronary occlusion.

Savage, Gerald Theophilus, Milwaukee; Milwaukee Medical College, 1911; member of the American Medical Association; served during World War I; died Feb. 14, aged 72, of coronary sclerosis.

Steel, John C., Chagrin Falls, Ohio; Cleveland University of Medicine and Surgery, 1897; served as postmaster and as mayor; died Feb. 12, aged 82, of cerebral thrombosis.

Stockton, Marcellus Lowry, Oroville, Calif.; Columbus Medical College, 1887; served during World War I; at one time a member of the state legislature of Kansas; died recently, aged 89, of coronary thrombosis.

Stokes, James Bell, Excello, Mo.; National University of Arts and Sciences Medical Department, St. Louis, 1918; served as county coroner; died in Fulton Jan. 17, aged 64, of cerebral hemorrhage.

Stone, Otis Bush, Libertytown, Md.; University of Maryland School of Medicine, Baltimore, 1893; member of the staff of Frederick Memorial Hospital in Frederick; died Jan. 5, aged 81.

Taylor, William Braxton, Dexter, Ga.; University of Georgia Medical Department, Augusta, 1890; Atlanta Medical College, 1897; died Feb. 18, aged 85, of cerebral hemorrhage.

Teisberg, Carl Benjamin ✠ St. Paul; University of Minnesota College of Medicine and Surgery, Minneapolis, 1906; fellow of the American College of Surgeons; on the staffs of St. Joseph's, St. Luke's, Miller, and Ancker hospitals; died Feb. 9, aged 72, of coronary thrombosis.

Thill, George Eugene ✠ Milwaukee; Marquette University School of Medicine, Milwaukee, 1931; member of the American Academy of General Practice; instructor at Mount Mary College; on the staffs of St. Anthony and Deaconess hospitals; died Jan. 5, aged 46, when his private plane crashed in Lake Michigan.

Thomas, Thomas R., Lima, Ohio; Rush Medical College, Chicago, 1899; fellow of the American College of Surgeons; died in Lima Memorial Hospital Feb. 10, aged 78, of coronary thrombosis.

Thompson, Frederick Gregg, St. Joseph, Mo.; Trinity Medical College, Toronto, Ont., Canada, 1888; member of the American Medical Association; fellow of the American College of Surgeons; visiting surgeon, St. Joseph's and Missouri Methodist hospitals; consulting surgeon, Ellis Fischer Cancer Hospital in Columbia; senior consultant, Thompson-Brumm-Knepper Clinic; died Feb. 5, aged 86, of coronary occlusion.

Thumme, Harry Frederic ✠ Sebewaing, Mich.; Detroit College of Medicine, 1921; served during World War I; died Feb. 1, aged 56, of cerebral hemorrhage.

Tidmore, Joseph Christopher, Dawson, Ga.; Emory University School of Medicine, 1936; affiliated with Terrell County Hospital; county physician; died in Piedmont Hospital, Atlanta, Jan. 18, aged 40, of uremia.

Todd, Calvin Deverde, Washington, D. C.; Toledo Medical College, 1907; for many years affiliated with Veterans Administration; died in Chevy Chase, Md., Jan. 11, aged 74.

Tomlinson, William Elijah Jr., Richmond, Va.; Medical College of Virginia, Richmond, 1929; served during World War II; physician for the Du Pont Company; died Jan. 27, aged 44.

Tonnous, Thomas Scander, Pleasant City, Ohio; Marquette University School of Medicine, Milwaukee, 1943; member of the American Medical Association; served during World War II; on the staffs of Swan Hospital and St. Francis Hospital, in Cambridge, where he died Jan. 11, aged 34, of coronary occlusion.

Vincent, William Tecumseh Sherman, La Porte, Texas; Medical College of Ohio, Cincinnati, 1889; died Jan. 12, aged 87, of heart disease.

Ware, Marvin Brister, Jackson, Miss.; Jefferson Medical College of Philadelphia, 1929; member of the American Medical Association and Southeastern Surgical Congress; fellow of the American College of Surgeons; visiting surgeon, Mississippi Baptist and Mississippi State Charity hospitals; died Feb. 25, aged 46, of coronary thrombosis.

Watson, Harry Thomas, Gallup, N. Mex.; Keokuk Medical College, College of Physicians and Surgeons, 1906; past president of the New Mexico Board of Medical Examiners; associated with the Indian Service; died in St. Joseph's Hospital, Keokuk, Iowa, Jan. 22, aged 71, of bronchopneumonia and pulmonary tuberculosis.

Webster, George Alexander Milton, Chicago; Meharry Medical College, Nashville, Tenn., 1923; died Feb. 14, aged 58, of coronary heart disease.

Weller, Edward V., Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1900; member of the American Medical Association; affiliated with Presbyterian Hospital; died Feb. 20, aged 81, of cerebral hemorrhage.

Welliver, William Evan ✠ Lock Haven, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1910; affiliated with Lock Haven Hospital, where he died Jan. 22, aged 65, of complications resulting from gout.

West, Thomas Marshall, Havertown, Pa.; University of Maryland School of Medicine, Baltimore, 1908; fellow of the American College of Surgeons; on the staff of the Williamsport (Pa.) Hospital; died in Bryn Mawr (Pa.) Hospital Feb. 18, aged 75, of uremia and nephrosclerosis.

Weum, Thurston William ✠ Minneapolis; Northwestern University Medical School, Chicago, 1908; member of the Central Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; clinical instructor of obstetrics and gynecology at University of Minnesota Medical School; affiliated with University of Minnesota Hospital, St. Mary's Hospital and Northwestern Hospital; died recently, aged 69, of hypertensive arteriosclerotic carditis.

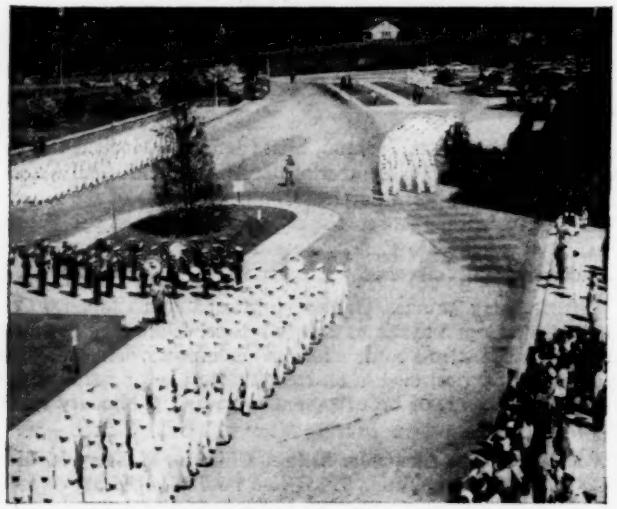
Whiteside, John McIntyre, Talladega, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1884; University of Nashville Medical Department, 1884; member of the American Medical Association; died in Citizens' Hospital Dec. 27, aged 89, of cerebral thrombosis.

GOVERNMENT SERVICES

NAVY

New Head of Medical Center.—Rear Adm. Bertram Groesbeck Jr. became the new commanding officer of the National Naval Medical Center at Bethesda, Md., April 30. The traditional naval ceremony was witnessed by many official guests and high ranking officers, and was followed by a review of the various naval companies on duty at the medical center.

Rear Admiral Groesbeck was first commissioned in the Naval Reserve on April 7, 1917. In a few months he transferred to the regular Navy. His rank as rear admiral dates from 1942. In 1922 he was ordered to the Pensacola Naval Air Station for instruction in aviation and since then has served at various naval air stations in this country and abroad. Among the ships on which he has served are the USS Xarifa, USS Houston, USS Canopus, USS Luzon, USS Yorktown, USS Enterprise, USS Kittery, and the USS Jasson. He has also served at various naval hospitals, at the medical research laboratory at Mitchel Field in Long Island, in the Pacific area during World War II and on the staff of the Commander Air Forces, Pacific fleet, from De-



Review for the new commandant.

cember, 1944, to September, 1945. He was formerly chief of the Division of Aviation Medicine in the Bureau of Medicine and Surgery and became assistant chief of the bureau in 1951. In addition to his experience in aviation medicine, he is especially qualified in the diseases of the eye, ear, nose, and throat. Among various medals and honors which Admiral Groesbeck has received is the Lyster Award from the Aero Medical Association, of which he is now the president-elect.

Dr. Karsner Lectures in Cleveland.—Dr. Howard T. Karsner, medical research advisor to the Surgeon General, lectured to the staff of Crile Veterans Administration Hospital May 15, at Cleveland, on "Diseases of the Blood Vessels of the Lungs." Dr. Karsner, while in Cleveland, also was the principal speaker at the 50th anniversary celebration of the Cleveland Academy of Medicine. During the celebration on May 18, at convocation ceremonies of civic organizations, he gave an address entitled "The Past Is Prelude," which was a review of the advancements in medicine during the past 50 years.

Rear Admiral Agnew Retires.—Rear Adm. William J. C. Agnew, commanding officer of the National Naval Medical Center, was transferred to the retired list of the U. S. Naval Service on May 1, 1952. On April 30 a change of command ceremony was held to pay tribute to the retiring admiral on his completion of more than 35 years of active service in the Navy, and to welcome aboard the new commanding officer, Rear Adm. Bertram Groesbeck Jr. (MC), USN.

PUBLIC HEALTH SERVICE

Trainees from Foreign Countries.—Three members of the faculty of the Medical College Dacca, Pakistan, are among the foreign trainees who have come to the United States under the sponsorship of the Public Health Service, in cooperation with the Mutual Security Agency and the Technical Cooperation Administration. Among other new arrivals in the past two months are three physicians from Thailand, Pakistan, and Brazil, a veterinarian from Thailand, and a sanitary engineer from the Netherlands.

The three members of the Dacca Medical College faculty are: Drs. Anwar Ali, A. K. M. Abdul Wahed, and Md. Abdul Karim. Dr. Ali is professor of pathology at the Medical College and bacteriologist and serologist to the Government of East Bengal. He will devote his year's study to work in pathology. Dr. Wahed, who is a graduate of Calcutta Medical College and has studied in London and Edinburgh, is professor of medicine. His postgraduate training in the United States will be in internal medicine. Dr. Karim, also a graduate of Calcutta Medical College and professor of physiology at Dacca Medical College, will take training in physiology. All three physicians are studying under grants from the Technical Cooperation Administration.

Also from Dacca, Pakistan, is Dr. Amjad Ali Talukder, who is assistant director of public health, Dacca Circle, East Bengal. Dr. Talukder is a graduate of the Medical College of Calcutta and the All India Institute of Hygiene and Public Health. He will spend four months in this country studying tuberculosis control.

Among the trainees from Thailand are Drs. Sombhong Siribhakdi and Dr. Tiang Tan Sanguan. Dr. Siribhakdi, assistant director of the Chiengrai Government Hospital, will spend a year in the United States studying general surgery, surgical pathology, and anatomy. Dr. Sanguan, who is a lecturer in bacteriology on the faculty of Veterinary Science, University of Medical Science, Bangkok, and was formerly head of the vaccine and serum production section, department of livestock development, will spend six months touring the United States to visit veterinary schools and serum and vaccine producing laboratories.

A medical officer in the Service Especial de Saude Publica of Belem, Brazil, Dr. Rainerode Carualbo Maroja will spend four months in the study of the bacteriology of enteric organisms under a Technical Cooperation Administration grant.

New Chief of States Services.—The appointment of Dr. Otis L. Anderson as chief of the Bureau of State Services, Public Health Service, has been announced. Dr. Anderson succeeds Dr. Joseph W. Mountin, who died suddenly on April 26. He will direct the broad federal-state and interstate programs of the service. These programs encompass most of the public health activity carried on in cooperation with the states and with local communities. They include work in the fields of tuberculosis, venereal diseases and chronic diseases, water pollution control, occupational health activities and vital statistics, along with the administration of the Public Health Service grant-in-aid program to states. In addition to its headquarters' activities, the bureau also administers three field stations: The Communicable Disease Center at Atlanta, Ga.; the Environmental Health Center, Cincinnati; and The Arctic Health Center, Anchorage, Alaska. Dr. Anderson, a native of Lincoln, Neb., entered the commissioned corps of the Public Health Service in July, 1930, on completion of his internship at the Public Health Service Hospital, Baltimore, Md. He is a Fellow of the American Medical Association and of the American College of Physicians, a diplomate of the American Board of Preventive Medicine and Public Health, and a member of the American Public Health Association, the American Hospital Association, and the Association of Military Surgeons.

FOREIGN LETTERS

LONDON

Physicians' Pay.—Under the National Health Service, general practitioners are remunerated from what is known as a "central pool," into which is paid a sum of money made up essentially of (*a*) £19,890,000, the estimated net remuneration of general practitioners in 1939, (*b*) a "betterment factor," and (*c*) a sum for expenses. The amount paid into the central pool for the year ended March 31, 1951, was 18*s.* per person for 95% of the population, a total of £41,533,000. The figure for the estimated net remuneration of general practitioners in 1939 was based on a recommendation of the Spens Committee, which was named after the chairman, Sir William Spens. The committee was organized during the preliminary discussions that preceded the setting up of the National Health Service to advise on the amount of remuneration that general practitioners should receive. The committee also recommended that this remuneration be based on the estimated net income of physicians plus a betterment factor to allow for the increased cost of living and the increased income of other professions. It was on the condition that the betterment factor be the subject of immediate negotiation that the general practitioners of Great Britain, through the British Medical Association, consented to take part in the National Health Service on its inauguration in 1948. These negotiations came to nought. Mr. Bevan, then Minister of Health, arbitrarily fixed a betterment factor of 20% on net incomes and refused to alter this figure. It was not until he was succeeded in office by Mr. Marquand that a more reasonable and conciliatory atmosphere developed, the result of which was that Mr. Marquand made an offer to submit the matter to an independent adjudicator to be appointed by the lord chancellor. He promised to accept the decision of the adjudicator, provided the British Medical Association did the same and provided the British Medical Association agreed to the organizing of a working party, consisting of representatives of the Ministry of Health and the British Medical Association, to consider means for the more efficient and equitable distribution of the central pool. This offer was accepted by the British Medical Association, and, in due course, Mr. Justice Danckwerts, a High Court judge, was appointed adjudicator.

Mr. Justice Danckwerts has now made his award, which is based on a betterment factor of 100%, and the increase is to be retroactive to 1948, with adjusted betterment factors for previous years, e. g., 85% for 1948. This award, which was immediately agreed to by Mr. Crookshank, the present Minister of Health, will involve the government in an additional expenditure of £40,000,000, subject to improved methods of distributing the central pool agreed upon by the working party, which is now considering the problem. It is not altogether a surprise that the announcement of this award is already being used for political purposes by certain members of the party now in opposition in Parliament. It is, therefore, necessary to emphasize that this is merely the belated carrying out of a promise that was made to the general practitioners when they consented to come into the service. As *The Times* points out, the Danckwerts award means that "the family doctor has been underpaid by the State ever since the health service was launched."

The tendency since the inception of the National Health Service has been to glorify the specialist at the expense of the general practitioner, with the inevitable result that the pick of the young graduates have tended to go into specialist, or consultant, practice. Two major problems are involved; the first is to insure that, in order to obtain a reasonable income, a general practitioner should not need to take on an excessive number of patients, as is at present the case. One way that has been suggested for overcoming this difficulty is to provide a larger capitation fee for the first 2,000 patients, with a rapidly diminishing fee for the next 1,000. The other problem concerns giving general practitioners access to hospital beds. If general practitioners could make a reasonable income with fewer patients than at present and have access to hospital beds, not only would their standard of work rise but also the waiting lists and congestion in outpatient departments in hospitals would automatically decrease. It is generally agreed by those running the National Health Service that a satisfactory general practitioner service would do more for the solvency and efficiency of the service than anything else.

Cancer in London.—In 1938, the British Empire Cancer Campaign instituted a survey of cancer in all the hospitals in the county of London. In spite of the 1939 to 1945 war, it was possible to obtain the requisite details of 15,201 cases, and a five-year follow-up was successful in all but 400 (2.63%) of the cases. A detailed analysis of this material, prepared by Lieut. Col. W. L. Harnett, the secretary to the clinical cancer research committee of the British Empire Cancer Campaign, has now been published under the title of "Survey of Cancer in London." In his introduction, Sir Heneage Ogilvie describes it as "something unique in scientific literature. Never has so large a series, entirely unselected, representing the results of research not by one expert, but by the staffs of many hospitals, been collected. Never has an analysis so detailed, so carefully checked, and so impartial, been presented." It is "a fairly representative sample of the population of Southern England." Space can only be found here for a survey of some of the more salient findings. The stomach (12.2%), rectum (12.11%), lungs (12%), and skin (9.43%) were the commonest sites in males; in females, the breasts (29.7%) and the cervix uteri (11.99%) were the commonest sites. The peak incidence for both sexes was in the age group 60 to 65 years, 17.97% for men, and 14.38% for women. Prior to this, the percentage incidence in each age group from 25 years onwards was higher in women, but, after 65 years, the percentage incidence in each age group was lower in women. Although the "difference between the percentages of males and females who gave a family history of cancer" was statistically significant, the absence of control figures and the high proportion of case histories in which the question was not answered "renders it impossible to draw definite conclusions." Occupations that showed a significant excess were: (1) general and dock laborers, cancer of the lip, mouth, and penis; (2) brewers, publicans, barmen, and waiters, cancer of the pharynx, esophagus, and rectum; (3) agricultural laborers, gardeners, and florists, cancer of the lip, mouth, tongue, prostate, and rodent ulcer and squamous cell cancer of the skin; (4) chemical workers, workers in pitch tar or mineral oil, and makers of coal gas, skin cancer in all the sites mentioned and also, in coal gas workers, rodent ulcer; (5) singers, actors, and clergymen, cancer of the larynx; and (6) engineers, fitters, and mechanics, "a slight excess of cancer of the stomach, and an apparent excess of cancer of the lung." The interval between the first symptom and the first consultation with a physician was under three months for 53.1% of the patients and over six months for 20.8%. There was much variation in these figures, according to the region affected. In cases of cancer of female genital organs, a vaginal examination was made within one month of the first consultation in 80.3% of the patients; the corresponding figure for rectal examination in cancer of the rectum and anus was 61.6%. On admission to hospital, only 29.9% of the cancers were in stage 1 ("confined to tissue or organ of origin, lymph nodes not involved clinically") and 21.4% were in stage 4 ("remote metastases present") and, therefore, inoperable. The percentage of patients known to be alive at the end of five years was 36.5% for those who underwent radical surgery, 40.1% for those treated by radical combined methods, and 25.2% for patients treated by radiotherapy. The percentages of five year survivals in stage 1 were 55.2% for patients treated by radical combined methods, 47.5% for those treated by radical surgery, and 43.7% for those treated by radiotherapy. A total of 23%

The items in these letters are contributed by regular correspondents in the various foreign countries.

of all patients were unsuitable for any form of treatment, because of poor general condition or the advanced stage of the disease.

William Harvey.—The mayor of Folkestone invited representatives of the Harveian Society, the Edinburgh Harveian Society, the Royal College of Physicians, the Royal Society of Medicine, Gonville and Caius College, Cambridge, Merton College, Oxford, St. Bartholomew's Hospital, the British Medical Association, and the Grocers Company to come to Folkestone April 1, to celebrate William Harvey's birth there in 1578 and to discuss the question of removing the remains of Harvey. A resolution was adopted to the effect that Harvey's remains be removed from Hempstead Church in Essex to a more appropriate resting place. The four alternatives that were mentioned were Folkestone Parish Church, Canterbury Cathedral, Westminster Abbey, and St. Bartholomew's, London. The president of the Harveian Society reported that it was only a matter of time before Hempstead Church fell into ruins. First-aid repairs had been effected last year, but £16,000 to £25,000 would be required to restore and endow the church. Neither church funds, the medical profession, or the Society for the Protection of Ancient Buildings could do anything to meet this expenditure. The only solution, therefore, appeared to be transfer of the remains to another resting place. A letter was read from the Bishop of Colchester, in whose diocese Hempstead lies, stating that he intended to oppose to the utmost a transfer of the sarcophagus from Hempstead. He added that he had been informed that, in his will, Harvey had asked to be buried at Hempstead. This was denied by the president of the Harveian Society.

Hypnotism—Stage and Medical.—In view of the recent reference in this correspondence to stage hypnotism, it is of interest to record that a stage hypnotist has now had £1,000 damages awarded against him. He was sued by a young lady who volunteered to be an experimental subject on the stage. She claimed damages on the grounds that the stage hypnotist had been negligent in that he had instilled depressing suggestions into her mind and had not, before bringing her out of her trance, implanted in her mind any reassuring belief that all was really well and that she had no cause to be frightened. She alleged that because of this she subsequently suffered from depression for a long time. At present, a bill is before Parliament, sponsored by a number of medical members of Parliament, "to make illegal the demonstration of hypnotic phenomena for purposes of public entertainment." Hypnotism is defined as follows: " 'Hypnotism' includes mesmerism and any similar act or process which produces or is intended to produce in any person any form of induced sleep or trance in which the susceptibility of the mind of that person to suggestion or direction is increased or intended to be increased but does not include hypnotism, mesmerism or any such similar act or process which is self-induced." There is a clause exempting from the enactments of the bill hypnotism "for scientific or research purposes or for the treatment of mental or physical disease."

Diphtheria Statistics.—Records showing a new low for diphtheria incidence have just been announced by the Ministry of Health. In 1951, in England and Wales, there were 32 deaths and 699 notified cases. The corresponding figures for 1950 were 49 and 959. At the same time, a detailed analysis of the figures for 1950 have been issued. This shows that, during this year, in the 83 county boroughs in England and Wales, there were 70 in which there were no deaths from diphtheria and 33 in which there were no confirmed cases. During the five year period 1946-1950, in 14 country boroughs, with a total population of nearly 1,125,000, there was not a single death. It is estimated that if an unimmunized child develops diphtheria, his chances of dying from it are seven times greater than those of an immunized child. In an accompanying statement, Dr. W. P. D. Logan, chief medical statistician of the General Register Office, states, "The situation is now being reached . . . where the eradication of diphtheria as an indigenous disease in this country can be foreseen as a very real possibility within the next few years, providing there is no slackening in the immunization efforts that have been so dramatically successful in the past 10 years."

NORWAY

Treatment of Alcoholics in General Hospitals.—Hitherto, it has generally been assumed that the medical ward of a general hospital is not a suitable place for the treatment of chronic alcoholism. This traditional teaching has recently been challenged by several hospital physicians in Norway, and, since May, 1951, a deliberate break has been made with it at the Stavanger City Hospital, where the medical department is in the charge of Dr. Per Hanssen. One of his colleagues, Dr. Arnfinn Engeset, recently reported on this experiment, the success of which he mainly attributes to the cooperation of two local organizations for alcoholics; the members of these groups are pledged to help one another in curing themselves. Experience with this experiment has shown that there is little prospect of success unless treatment is supported by such organizations. Indeed, the importance attached to this cooperation is so great that lately one of the conditions required of candidates for admission to the Stavanger City Hospital is that they first establish contact with one of the two local organizations. These organizations should keep in touch with the patient before and after hospital treatment.

Only 1 of the first 42 patients treated since May, 1951, was so disorderly that he gave the nurses serious trouble. The patients were kept in bed for the first three days, without clothes. Recently, they have, as a rule, been allowed to get up sooner, and smoking has been allowed at certain hours. The patients are taught to regard their alcoholism as a disease requiring medical treatment, as does any other illness. This teaching puts them on the same footing psychologically as their fellow-patients. Dr. Engeset learned the importance of injections of insulin and tetraethylthiuram disulfide (antabuse®) or "aversan" bis (diethylthiocarbamyl) disulfide given orally. The increased appetite resulting from the insulin injection helped to promote a sense of well-being and check the craving for more alcohol. Barbiturates, on the other hand, are not thought highly of as a remedy for chronic alcoholism in the Stavanger hospital. In large doses, they are apt to induce giddiness and partial loss of consciousness, and chronic alcoholics are often tempted to resort to barbiturates as a substitute for alcohol. The distaste for alcohol created by tetraethylthiuram disulfide was, as a rule, experienced only a few hours after its administration, and, even when this drug was discontinued on the patient's discharge from hospital, its effects continued to be felt for several days.

Fetal and Neonatal Mortality.—Prof. Leif Salomonsen, who is in charge of the children's department of the Rikshospital in Oslo, recently gave a statistical report on neonatal mortality, i. e., mortality during the first month of life. Although there has been a marked fall in infant mortality, i. e., mortality during the first 12 months of life, there has not been a corresponding improvement in the neonatal mortality rate as is shown by the following figures for Oslo, where, between 1900 and 1950, the infant mortality rate fell from 125 to 21 per 1,000 live births. In the same period, the deaths occurring during the first month of life, expressed as a percentage of the deaths occurring during the first 12 months of life, rose from 24 to 61 per 1,000. At present, about 17 per 1,000 of the live births in Norway end in death during the first month. About 50% of these deaths occur during the first day of life, 32% during the rest of the first week, 9% during the second week, 6% during the third week, and 3% during the fourth week. These figures stress the well-known observation that the first day of life is the most critical. As is true of the premature infant, the postmature infant, born after a pregnancy lasting more than 290 days, is in great danger during the first day of life. Postmature infants weighing more than 4,000 gm. and measuring more than 54 cm. in length constitute about 2% of all births.

Professor Salomonsen calculates that if the number of fetal deaths (stillbirths) is added to the number of neonatal deaths, about 3.5% of the infants born in Norway die before, during, or shortly after birth, a loss of about 2,300 human lives out of 65,000 babies born in Norway every year. The task of reducing mortality at the beginning of life is much hampered by the lack of accurate data regarding the true causes of death. The clinical and pathological-anatomic evidence of the causes of death is often incomplete, and about half the deaths are

officially recorded as being due to congenital debility plus malformations. Such fatal debility in infancy is comparable with the equally noncommittal and noninformative diagnosis of debility as a cause of death among old persons.

Professor Salomonsen contrasts the relative ignorance and impotence marking the present state of affairs before and directly after birth with the success recently achieved in reducing the mortality during the first 12 months of life. One of his compatriots, Dr. Utheim-Toverud, showed that a well-organized infant welfare scheme in one section of Oslo reduced the infant mortality rate in the period 1939-1944 to 14 per 1,000, whereas the corresponding figure for the same period for the whole of Oslo was 30 per 1,000. Dr. Rietz gave statistics for Sweden showing the same low infant mortality rate of 14 per 1,000 in well-to-do families in Stockholm at a time when the infant mortality rate for the whole of Sweden was between 60 and 70 per 1,000.

Statistical Cancer Research.—In cooperation with the World Health Organization and on the same lines as those followed by Denmark, England, France, Canada, Holland, Switzerland, and some sections of the United States, the Norwegian public health service has taken steps to provide for a unified system of registration of cases of cancer in Norway. A committee on which senior hospital physicians, pathologists, radiologists, and statisticians were represented has devised a registration form the details of which represent a compromise over the ideal form. As the new form may not be ideal in every detail, the physicians to whom it is sent are invited to give constructive criticism of it. Patients with cases diagnosed before October 17, 1951, are not to be included in the new register, even if they present themselves for reexamination or renewed treatment after this date. Supplementary information is required once a year about the patients registered after this date, and such items as change of diagnosis or change of clinical condition (recurrences, metastases, etc.) are also to be reported. Dr. Fredrik Mellbye, who is head of one of the departments of the Norwegian Ministry of Health, is in charge of the new cancer register.

Another statistical study of cancer has recently been undertaken by Prof. Leif Kreyberg, who is circularizing all physicians in Norway with the request that they fill in and return to him a form giving details about their tobacco habits. In cooperation with Professor Kennaway of St. Bartholomew's Hospital, London, the Institute for General and Experimental Pathology at the University of Oslo is seeking, by this inquiry, to ascertain whether there is any connection between smoking and cancer of the lungs. The physicians circularized are requested to state their sex, as Professor Kreyberg wishes to distinguish between the smoking habits of the sexes.

All-Scandinavian School of Public Health.—On the initiative of the Norwegian Public Health Service, discussions have been taking place for some time between the representatives of the public health services of Denmark, Finland, Iceland, and Sweden about the creation of an all-Scandinavian school of public health with headquarters in Gothenburg. These Scandinavian countries have a total population of 18 to 19 million, but, individually, they are too small to run separate schools of public health. It is for this reason that the postgraduate study of public health has entailed a considerable exodus to foreign countries, where public health conditions and problems are not exactly the same as in the Scandinavian countries. It is hoped that the proposed school in Gothenburg may ultimately serve the needs of all Scandinavian public health specialists and also become a center of learning that will be attractive to physicians in other countries. The municipal authorities of Gothenburg have already put a site at the disposal of the proposed school, and cooperation has been assured between the school and Gothenburg's Technical High School in regard to sanitary engineering. The Kellogg Foundation, the Rockefeller Foundation, and the World Health Organization have shown great interest in this scheme. It was, however, made clear last fall at a meeting of the representatives of the Scandinavian public health services that Denmark was not as interested as the other Scandinavian countries in the scheme, as the need for specialists in this field is not great in Denmark. In commenting on the situation and the possibility that American aid may not be forthcoming, Dr. Karl Evang, who is head of the Norwegian Public Health Service, writes in *Nordisk Medicin* for March 28, that, in his opinion, it would be a great mistake to abandon the scheme for want of such aid. The Scandinavian countries should, he thinks, be able, if necessary, to solve this problem without aid from abroad.

SWEDEN

In Fiscal Defense of "Brain Workers."—Sveriges Akademikers Centralorgnisation (SACO) is an organization about which a keen controversy has been raging in Sweden. The name can be translated as Sweden's Central Organization of Academicians. This body is not, however, solely concerned with academicians in the Anglo-Saxon sense, having as its members "brain workers," intellectuals and scholars, such as school teachers, lawyers, engineers, physicians, and veterinary surgeons. At first, SACO was not taken seriously, and, because it embraced so many different groups, private persons as well as state and municipal employees, it was anticipated that uniformity of action would be difficult, if not impossible. But lately, SACO has been the object of hearty abuse by the left wing press; it has evidently become a power to be reckoned with.

SACO's aim is to defend the fiscal interests of its members and to help them overcome difficulties with regard to such problems as fair promotion. When negotiations between its members and state and municipal employers prove unsatisfactory to the former, it uses the strike or threat of strike as a lever, confining such action to one small group at a time, so that the cost of action by this group can be borne without difficulty by the members groups. Thus, early in February, a group of teachers working at 14 different schools handed in their resignations. A few days later, a group of state-employed lawyers did the same. A group of electrical engineers followed suit, and so the siege has continued, stage by stage. The Swedish Medical Association, which is affiliated with SACO, has threatened to join in the conflict by sending the government the resignations of its government-employed members, with notice to the effect that the corresponding appointments will not be sought when vacant by other members of the association. Every member of the association is invited to contribute 50 Swedish crowns a month to a fund to finance the strikes. As pointed out in the organ of the Swedish Medical Association, the academic conflict is not concerned only with salaries. It is also concerned with the right of physicians to maintain their professional status. In the left wing lay press, SACO's action is described as reactionary, and its employment of the strike as a persuasive factor while bargaining is severely censured.

The Sequelae of Thrombosis in the Legs.—Acute venous thrombosis in the legs has, until recently, been treated with offhand resignation; if the patient did not promptly die of pulmonary embolism, he was discharged from the hospital as cured after six to eight weeks. With growing appreciation of the seriousness and numerical importance of these cases, the staff of the Serafimer Hospital recently started a survey of the incidence of acute venous thrombosis in Sweden. At the annual meeting of the Swedish Surgical Society in 1950, Dr. Gunnar Bauer of Mariestad called for a national survey of this condition, with reference to its incidence in Sweden. He also pledged for more rational treatment than had hitherto been employed. In a communication to the Société Internationale de Chirurgie, delivered as an opening address in Paris, in September, 1951, he showed by results achieved how much can be done by early diagnosis and modern treatment, including injections of heparin and operations such as division of the popliteal vein.

The importance of early diagnosis was demonstrated by citing the cases of 421 patients who had been admitted to the hospital for other complaints and in whom thromboses had developed after admission. This accident involved the deep veins of the leg below the knee in 404 patients (96%). The femoral vein or the pelvic veins were involved in 7 patients, and, in 10 other patients, the site of origin of the thrombosis could not be determined with accuracy. A group of 228 patients in whom acute thrombosis was discovered while the disease was limited to the part of the leg below the knee, was subjected to a follow-up

examination 10 months to two years later. Among the patients in whom the disease had been arrested at the time of its discovery, there were 160 who were found, on reexamination, to be completely symptom-free, whereas there were 65 who suffered from no other sequel than slight edema at the end of the day. There remained only three patients who, on reexamination, were found to have severe swelling of the leg. Dr. Bauer attributes this remarkable achievement mainly to early diagnosis and injections of heparin. He also gave injections of heparin when thrombosis extended to the thigh, but, in such cases, follow-up examinations have shown results inferior to those cited above. With regard to operative treatment, Dr. Bauer has been interested in resection of the popliteal vein, a procedure which, since it was first attempted in Mariestad, in 1947, has been carried out 440 times for the relief of pain, chronic edema, and indurative changes in the skin. Satisfactory healing occurred after operation in more than 87% of the patients. Dr. Bauer finds it difficult to discriminate between the merits of this operation and others such as sympathectomy.

Multiple Inoculations in Infancy.—At Uppsala, a system of multiple inoculation during the first year of life has recently been extended to all the child welfare centers run by the municipal authorities. In their account of this system, Drs. Ericsson, Hesselvik, and Vahlquist have pointed out that inoculation should be started at the age of 3 months, when the congenital passive immunity of an infant has ceased to be effective. At this stage, a triple whooping cough, diphtheria, and tetanus vaccine is given by subcutaneous injection and repeated twice, at intervals of about six weeks. This triple vaccine, prepared by the Swedish State Bacteriological Laboratory, does not provoke any alarming local reactions, and the momentary pain that it causes may be appreciably reduced by the addition of lidocaine (xylocaine) hydrochloride, in a concentration of 0.33%, to the vaccine. There were only three cases of subcutaneous sterile abscess formation at the site of the injection in the course of 1,500 injections. These abscesses healed uneventfully after aspiration and were probably caused by the presence of aluminum in the vaccine.

At the time the triple vaccine is given, tuberculin testing is done. BCG and smallpox vaccination are also given. An additional reason for crowding all the inoculations into the first year of life is the fear of poliomyelitis in connection with them if they are given later in life. Whatever the connection between inoculations and poliomyelitis may be, it is evident that the effect is practically unknown in infancy, which is thus a comparatively safe time for prophylactic vaccinations. As both diphtheria and tetanus are much reduced in frequency (there were only 40 cases of diphtheria in Sweden in 1950, and there are only 30 cases of tetanus every year), vaccination against these diseases hardly seems necessary.

Compensation for Tuberculosis as an Occupational Disease.—In a motion dated Jan. 24, 1952, addressed to the Swedish Parliament, attention is drawn to the hardships inflicted on persons who have contracted tuberculosis in asylums, sanatoriums, and other hospitals; their cases are not classified as occupational diseases qualifying for financial compensation. A few years ago, an attempt was made to revise the law of June 14, 1929, in this respect, and, in 1948, the Swedish Ministry of Health and the National Insurance Institute issued a report on an inquiry into the incidence of tuberculosis in the personnel of various hospitals during the period 1942-1944. This inquiry brought out some striking facts. In the state asylums, the annual number of cases of tuberculosis per 1,000 posts or appointments was 20.3 for the age group 20 to 24 years, whereas it was only 8.3 for the same age group in general and fever hospitals. For all the age groups together, the rate was 6.2 per 1,000 for the asylums and 5.5 per 1,000 for the hospitals. The difference between the hospitals and the sanatoriums for all the age groups together was still greater, the figure of 5.5 per 1,000 for the hospitals being much smaller than the 15.2 per 1,000 for the tuberculosis institutions. Would-be employees of sanatoriums and other tuberculosis institutions are required to be tuberculin-positive before they begin work, and it is possible that the high tuberculosis rate in sanatorium personnel may be due, in part, to superinfection.

CORRESPONDENCE

LABORATORY PITFALLS IN DIAGNOSIS OF THYROTOXICOSIS

To the Editor:—The diagnosis of thyrotoxicosis has been facilitated by the determination of the protein bound iodine in the blood and by the uptake of I^{131} by the thyroid; however, there are many patients with borderline laboratory results suggestive of thyrotoxicosis but who are clinically not thyrotoxic. This anomaly has been observed in other clinics besides our own. The difficult diagnostic and therapeutic problems presented by these patients directed our attention to a number of factors that must be weighed carefully before final evaluation of the total clinical picture is made. It is felt that unless diagnosis of these borderline cases remains on a clinical level the uncritical physician may attach undue value to an abnormally high basal metabolic rate, high uptake of I^{131} by the thyroid, or increased protein bound iodine.

False values in protein bound iodine and in the uptake of I^{131} are commonly observed in patients who have ingested desiccated thyroid, antithyroid drugs, and iodine-containing medication or radiopaque material. Repeated administration of mercurial diuretics may lower the blood iodine, because the mercurial can remove iodine by combining with it. Iodine-poor diets may also influence both the blood iodine and the uptake of tracer doses of I^{131}.

The function of the thyroid is influenced by many dynamic factors and is therefore subject to normal physiological fluctuations, such variations being readily reflected in changes of oxygen consumption or in the uptake of iodine. An increased basal metabolic rate is frequently manifested by the nervous or apprehensive patient. Such an abnormal test may be restored to normal by suitable sedation.

We now feel that acute and chronic anxiety may also stimulate transient and fluctuating hyperfunction of the thyroid, as shown by an increased basal metabolic rate or uptake of I^{131} by the gland. Yet such patients do not necessarily manifest clinical thyrotoxicosis, because continued observation with and without sedation and/or reassurance will frequently be followed by restoration of normal thyroid function together with normal laboratory tests. We suggest that in such cases spontaneous remission of a transitory hyperfunction had taken place or speculate that anxiety can influence thyroid function and that suppression of the anxiety by psychotherapy or by the simple device of sedating the patient during the diagnostic study will yield a normal basal metabolic rate and uptake of I^{131}. We have data, incomplete at this time, that suggest that sedation given between tests can restore to normal not only an increased basal metabolic rate but also the uptake of I^{131}. Empirical though this observation may be now, it would be in harmony with the fundamental physiological principle that thyroid function is responsive to emotional stimulation.

Unless the borderline cases or those patients suffering from anxiety are observed long enough, preferably with the help of suitable sedation, the abnormal laboratory data may mislead the unwary clinician, who will direct his patient to treatment for thyrotoxicosis rather than to the necessary psychotherapy. We suspect that such diagnostic and therapeutic errors are not infrequently made.

It must be emphasized again that the diagnosis of thyrotoxicosis rests not on laboratory data alone but rather on the total picture presented by the patient.

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BUREAU OF LEGAL MEDICINE AND LEGISLATION

SUMMARY OF STATE LEGISLATION OF INTEREST TO PHYSICIANS ENACTED DURING THE 1951 LEGISLATIVE SEASON

Including special sessions, the legislatures of almost every state were in session some time during the year 1951. Hundreds of proposals of definite interest to the medical and allied professions were considered. Many of these were reported in the Organization Section of THE JOURNAL at the time of their introduction or enactment, or both; the rest were merely indexed and placed in the Bureau's files, so that they may be referred to later if occasion for studying them arises. The following survey makes no attempt to report all of the proposals in which physicians might have an interest, or even all of such proposals that were eventually enacted into law. It is concerned only with what seem to be the most important of the proposals that actually became law in some state.

Allied Professions and Sundry Vocations

Chiropody.—A Pennsylvania law amended the definition of chiropody so that such practice would not include the amputation of the leg, foot, or toes or the treatment of systemic diseases of the bones, ligaments, or muscles of the feet or any part of the body, and a New Jersey law amended the Disability Benefits Law so as to authorize the treatment by chiropodists of persons claiming benefits thereunder.

Medical Technicians.—A California law provided for the licensing of clinical laboratory technicians, clinical laboratory technician trainees, and clinical laboratories. A clinical laboratory technician is defined as a person licensed to perform the technical procedures called for in a clinical laboratory under the direction of a clinical laboratory technologist or physician and surgeon.

Nursing.—A Pennsylvania law provides for the licensing and regulating of professional nurses. Laws providing for the licensing of professional and practical nurses were enacted in Florida, Idaho, and Tennessee. Laws providing for the licensure of practical nurses were enacted in New Hampshire and Vermont. New laws creating boards of examiners for vocational nurses were enacted in California and Texas. A Connecticut law provided an appropriation to the state department of health to establish a program of financial assistance to nurses who agree to practice in Connecticut for at least four years after they are licensed, and a Minnesota law authorized the state board of education to award nursing scholarships under certain circumstances to residents of the state. A Massachusetts law lowered the age limit for applicants for a nursing license from 20 to 19, and a New Hampshire law reduced the age limit from 21 to 20. A Pennsylvania law provided a deficiency appropriation to assist state-aided medical and surgical hospitals in meeting the cost of training student nurses.

Ophthalmic Dispensing—Opticians.—North Carolina and Wisconsin enacted licensing laws for dispensing opticians that permit dispensing opticians to replace or duplicate lenses without a prescription.

Optometry.—Laws in Minnesota, Tennessee, and Texas permit optometrists to make the necessary examinations of persons seeking assistance for the blind. An Indiana law provided for the creation of a school of optometry at Indiana University, and an Oklahoma law required the annual attendance at postgraduate programs of at least two days by persons licensed to practice optometry in the state. One Pennsylvania law amended the definition of optometry to read: "The examination of human eye and the analysis of ocular functions or the prescribing, providing, furnishing, adapting or employing any or all kinds and types of lenses and prisms, visual training, orthoptics, ocular exercises and any and all preventive and corrective methods for the aid, correction or relief of the human eye, its associated structures, appendages and functions." Another Pennsylvania law provided that the testimony of an optometrist licensed to practice in the state shall be received by any official board, commission, or agency as qualified evidence and that such institutions shall not discriminate between the practitioners of optometry and any other ocular practitioners.

Pharmacy.—A Montana law defined a prescription as an order given individually for the person for whom prescribed directly from the prescriber to the furnisher or indirectly to the furnisher by means of an order signed by the prescriber and bearing the name and address of the prescriber, his license classification, the name of the patient, the name and the quantity of the drug or drugs prescribed, the direction for the use, and the date of its issue. A Pennsylvania law defined a prescription as an order for drugs or medicines or combinations or mixtures thereof written or signed by a duly licensed physician, dentist, or veterinarian or other medical practitioner licensed to write prescriptions intended for the treatment or prevention of disease in man or animals.

Disease Control and Public Health

Rehabilitation Programs.—A West Virginia law provided regulations for the establishment, operation, and maintenance of centers for the vocational rehabilitation of disabled persons.

School Health Programs.—A Pennsylvania law authorized the board of education to furnish free milk to pupils attending kindergarten and the first grade. New laws relating to state appropriations and the use of federal funds in connection with school health programs were enacted in Arizona, Massachusetts, Oklahoma, South Dakota, Wisconsin, and Wyoming.

Alcoholism.—A Florida law provided for the establishment and operation of a state hospital for alcoholism, and a Texas law provided facilities for care and treatment of alcoholics. Laws providing for the creation of commissions or groups to study the problem of alcoholism were enacted in Georgia, Massachusetts, Minnesota, North Dakota, Rhode Island, and Vermont.

Communicable Diseases.—An Idaho law granted the department of public health the power to adopt and enforce rules for preventing the spread of infectious, communicable, and contagious diseases, and an Ohio law provided for the isolation and quarantine of persons exposed to and suffering from communicable diseases.

Epilepsy.—A California law amended the Welfare and Institutions Code by adding regulations relating to epileptics, among which are provisions making it possible to commit such persons to state hospitals when they are in need of treatment or when they are suffering from mental illness in addition to epilepsy.

Tuberculosis.—A Michigan law directed the Michigan Tuberculosis Sanatorium Commission to study the needs for alteration and construction of existing and new facilities for the treatment of persons suffering from tuberculosis. New laws in Florida and New York provided regulations relating to the isolation and treatment of persons having tuberculosis. Michigan and North Carolina provided appropriations for the construction of additional hospital facilities for tuberculosis sufferers, and Illinois authorized cities and villages to levy taxes for the operation of a tuberculosis sanatorium.

Physical Examination Programs.—New laws in New Hampshire and North Carolina made it unlawful for an employer to require an employee or applicant for employment to pay the cost of a medical examination or the cost of furnishing any records required by the employer as a condition of employment. A Massachusetts law amended the law relating to physical examinations of school children by providing that tests of sight and hearing shall be performed by teachers, physicians, optometrists, nurses, or other approved personnel and that a child would be exempt on religious ground from such examination on written request of his parent or guardian. A Vermont law required superintendents of schools to cause a qualified person to test the hearing of all pupils under his supervision in grades one, two, three, five, seven, and nine. The prior law permitted such examinations to be made by teachers.

Prepared by George E. Hall, Bureau of Legal Medicine and Legislation.

Foods, Drugs, Cosmetics, and Therapeutic Devices

Barbiturates, Hypnotics, Sulfonamides, and Other Drugs.—A California law amended the health and safety code by requiring hospitals to keep a record of the administration of hypnotic drugs, including the amount given, the type, the date, and the name and address of the person to whom administered. Another California law created an interim committee on narcotics and hypnotics to ascertain, study, and analyze all facts relating to narcotics and hypnotics including the operation, effect, administration, enforcement and needed revision of all laws bearing on the subject. Other new laws restricting the sale of certain drugs to sale on prescription were enacted in Arkansas, California, Connecticut, New Mexico, and Texas. The Arkansas law amended a 1935 law that applied only to barbituric acid by adding amphetamine and desoxynorephedrine. The California law applied to phenylhydantoin and hypnotic drugs. The Connecticut law added antibiotics, injectable biologicals, and sulfonamides to the existing list of prescription drugs. The New Mexico law applied to "dangerous drugs," which was defined to include hypnotic drugs, aminopyrine, cinchophen, diethylstilbestrol, ergot, cotton root, sulfonilamide, thyroid, and compounds thereof. The Texas law applied to barbituric acid, amphetamine, and desoxyephedrine.

Food and Drug Acts.—An amendment to the California Food and Drug Act provided that certain advertising restrictions in relation to drugs would not apply when the periodicals in which the advertisement is placed is intended or disseminated only to members of the medical, dental, pharmaceutical, or veterinary professions or to other practitioners of the healing art licensed to practice in the state. Two Connecticut laws amended the Food and Drug Act by providing that an article shall be misbranded if the label implies that the product is recommended or endorsed by any agency of the federal or state governments unless such agency has approved such statement prior to its use. New Mexico enacted the uniform Food, Drug, and Cosmetic Act.

Narcotics.—Washington enacted a uniform narcotic drug act. California and New York created special commissions to study and analyze facts and existing state laws relating to narcotics and hypnotics and their use and control. The New York law related only to narcotics. Other laws that also created commissions to study and survey the narcotic problem within the respective states were enacted in Michigan and New Jersey. An Illinois law provided for the establishment of a narcotics hospital in the city of Chicago and outpatient clinics in the city of Chicago, both for the treatment of narcotic addicts. New laws that either fixed or increased the penalties for selling narcotics to a minor were enacted in Alabama, California, Connecticut, Massachusetts, and Michigan. One Connecticut law defined narcotic drug to include isonipecaine (meperidine hydrochloride) and another amended the narcotic act by defining the word opiate as including all synthetic drugs having addiction forming or addiction sustaining properties similar to morphine and so proclaimed by the President of the United States under the provisions of the federal narcotic law.

Miscellaneous.—A Connecticut law provided that manufacturers shall not sell drugs to hospitals that are not recognized by the state department of health as a general or special hospital or to institutions not having a full-time pharmacist. A Maine law authorized the department of health to procure and distribute within the state antitoxins, serums, vaccines, viruses, and analogous products applicable to the prevention or cure of disease in man, for the purpose of aiding in national defense in case of war or emergency.

Hospitals

Licensing Requirements.—New laws in California and Illinois provided for the licensing and regulating of hospitals for the mentally ill. Three laws were enacted relating to the licensing of nursing homes. An Illinois law amended the existing law relating to the licensing of nursing homes by creating an advisory nursing home council. A Washington law provided regulations for the licensing and regulation of nursing homes. A Wisconsin law repealed and reenacted the law relating to nursing homes and, among other things, set up a new definition of nursing home and authorized the use of the injunctive process against any person or agency operating such a home without the required license or without being registered. New laws in Nevada, New York, and Washington provided regulations for the licensing of maternity or lying-in hospitals, and a Michigan law provided certain amendments to the existing law on this subject. A Florida law provided that no person shall operate a chiropractic hospital without first obtaining a license from the Florida State Board of Chiropractic Examiners. A Minnesota law amended the hospital licensing law by increasing the size of the advisory council from seven to nine and by defining hospitalization, maternity care, and chronic or convalescent care.

Liens.—A Florida law provided circumstances whereby hospitals may obtain a lien for all reasonable charges for the hospital care, treatment, and maintenance of ill or injured persons upon any and all causes of action accruing to such persons or their legal representatives.

Miscellaneous.—A Texas law resolved that the House go on record as requesting the Board of State Hospitals and Special Schools to take the necessary steps to meet the minimum standards required in order to qualify said hospitals and special schools operated by the state to meet the necessary standards for residency, intern, and nurses training programs, so that the patients of the said hospitals and special schools may be given the highest type of medical care and treatment possible.

Regulation of Healing Arts Practice

Annual Registration.—New laws in Florida and Vermont required the annual renewal of licenses of practitioners of medicine. The Vermont law provided for a forfeiture of license of persons who fail to annually renew as required. An Oklahoma law provided that if a person fails for three consecutive years to obtain a renewal certificate of registration, his original license to practice medicine or surgery will be automatically suspended.

Basic Science Laws.—Nevada enacted a basic science law requiring all persons, before taking an examination for a license to practice the healing art or any branch thereof, to present a certificate of ability in anotomy, physiology, chemistry, bacteriology, and pathology. The "healing art" is defined to include any system, treatment, operation, diagnosis, prescription, or practice for the ascertainment, cure, relief, palliation, adjustment, or correction of any human disease, ailment, deformity, injury, or unhealthy, abnormal, physical, or mental condition. An Arizona law amended the basic science act by exempting full-time practitioners of medicine for federal, state, county, municipal, or other governmental health departments and persons engaged in full-time practice of medicine for federal or state hospitals or institutions, and a Wisconsin law amended the basic science act by exempting therefrom dental hygienists. A Texas law amended the basic sciences act by permitting the issuance of temporary licenses effective until the next regular meeting of the board.

Citizenship.—A Florida law amended the medical practice act by requiring applicants for a license to be citizens of the United States. Previous law required them only to have filed a declaration of intention to become a citizen. This law also authorized the examining board to accept evidence from an applicant that he has received training in hospitals sufficient to bring his medical education up to a standard equivalent to that of graduates of approved medical schools in the event that the applicant is not a graduate of such a school.

Corporate Practice.—A Connecticut law provided that any three or more persons, licensed pursuant to the medical practice act, could associate to form a corporation without capital stock to own, operate, and maintain a clinic for the study, diagnosis, and treatment of human ailments and injuries by persons duly licensed and to promote medical, surgical, and scientific research and learning, providing that such corporation could not itself give medical or surgical treatment, consultation, or advice and provided that persons duly licensed, and no others, could be members of such corporation. One California law provided that nothing therein should be construed to authorize an insurer to furnish services of hospitals, nurses, or physicians and surgeons or in any manner to direct, participate in, or control the selection of the hospital or physician and surgeon from whom the insured secures services. Another law authorized the board of medical examiners to grant approval of the employment of physicians and surgeons on a salary basis by licensed charitable institutions, foundations, or clinics or by approved medical

schools operating clinics therein if no charge for professional services is rendered to patients by the institution.

Chiropractors.—A Pennsylvania law created a state board of chiropractic examiners and defined chiropractic as a system of locating misaligned or displaced vertebrae of the human spine, the examination preparatory to and the adjustments by hand of such misaligned or displaced vertebrae and other articulations, together with the use of scientific instruments of analysis as taught in approved schools and colleges of chiropractic without the use of either drugs or surgery. "Chiropractic" shall not include the practice of obstetrics or reduction of fractures or major dislocations. A Nevada law amended the chiropractic act by providing for the licensing of persons desiring to practice chiropractic physiotherapy, which the law defines to be the adjustment of the articulations of the human body by hand and the use of electrical, mechanical, hygienic, and sanitary measures, which measures do not pierce or sever the body tissues.

An Arkansas law amended the chiropractic act by increasing the number of hours that must be spent in education in a chiropractic school from three years of nine months each or not less than 2,700 sixty-minute resident hours of instruction to four years of nine academic months each or not less than 3,600 sixty-minute resident hours of instruction, and an Iowa law increased the course of study in chiropractic colleges from three to four years and not less than 4,000 sixty-minute hours of actual resident attendance. A Maryland law required the annual registration of chiropractors. A New Hampshire law provided that an applicant to practice chiropractic who matriculated in a chiropractic school after Jan. 1, 1951, shall be a graduate of a legally chartered school requiring for graduation completion of a course of study of not less than 3,600 classroom hours in four academic years. A Maryland law recommended to the director of civilian defense that he enlist the full cooperation and support of the chiropractic profession in whatever program is formulated for civilian defense.

Massage Practitioners.—An Oregon law provided for the creation of an Oregon state board of massage examiners and defined massage as pressure or friction against, stroking and kneading the body, and gymnastics, with or without such appliances as vibrators, infra-red heat, sun lamps, and baths, in order to maintain good health and to establish and maintain the body in good physical condition, provided that no person licensed under this act would be permitted to give chiropractic adjustment, osteopathic manipulations, or naturopathic manipulation.

Midwives.—California eliminated provisions relating to the licensing of midwives.

Naturopaths.—A Wyoming law created a board of naturopathic examiners and defined naturopathy to be a therapeutic system embracing a complete "physianthropy," employing nature's agencies, forces, processes, and products, except major surgery or obstetrics.

Osteopaths.—Pennsylvania laws defined the word medical examiner, in connection with private and parochial school examinations, as including practitioners of osteopathy and osteopathic surgery, and defined the word physician as an individual licensed under the laws of the state to engage in the practice of medicine and surgery or in the practice of osteopathy or osteopathy and surgery and defined the term "qualified physician" under the mental health act as including practitioners of osteopathy and osteopathic surgery. A Wisconsin law amended the medical practice act by eliminating reference to osteopathy and surgery and by providing that, if six members of the board find an applicant qualified, the board shall issue a license to practice medicine and surgery to such applicant. New laws in West Virginia and Vermont amended the osteopathic laws by requiring the annual registration of osteopaths and by requiring further that at the time of the annual registration the applicant show that he has attended a refresher course during the course of the year given by the state osteopathic association.

Physiotherapists.—New laws providing for the licensure of physiotherapists either by the state board of medical examiners or by independent examining boards were enacted in Florida, Georgia, Illinois, Massachusetts, Minnesota, New Hampshire, and North Carolina. A Connecticut law authorized the board of trustees of the University of Connecticut to offer instruction in physical therapy as a part of the University program and to grant suitable degrees therein. A New Mexico law provided that any resident member of the American Physical Therapy Association or the American Registry of Physical Therapists would be eligible for a certificate and license issued by the secretary of the state board of basic science examiners without examination. New York laws designated the board of medical examiners as the board of examiners in physiotherapy and amended the law relating to physiotherapy by providing that the administration of physiotherapy by a person employed under the control of a licensed physician or licensed physiotherapist in his office or in the civil service of the state or any political subdivision thereof, or employed in a duly incorporated hospital, established clinic, or in an infirmary maintained by a person, firm, or corporation employing one or more full-time licensed physicians or licensed physiotherapists would not be prohibited by law.

Psychologists.—Georgia and Minnesota enacted laws providing for the creation of a state board of examiners of psychologists. The Georgia law provided that a psychologist is a person who holds himself out to be an applied psychologist and renders to persons or to the public for fees any service involving the application of recognized principles, methods, and procedures of the science and profession of psychology, such as interviewing, administering, and interpreting tests of mental abilities, aptitudes, interests, and personality characteristics for such purposes as psychological diagnosis, classification, or evaluation or educational or vocational placement or for such purposes as psychological counseling, guidance, or readjustment. Nothing in this law shall be construed as permitting the administration or prescription of drugs or in any way infringing upon the practice of medicine. The Minnesota law contained no definition of psychologist. A New York law amended the mental hygiene law by changing the preliminary educational requirements of certified psychologists from three years' actual clinical experience to three years' full-time or equivalent part-time clinical experience in the psychological examination of children or mental defectives.

Acts Constituting the Practice of Medicine.—A California law amended the business and professions code by providing that whenever the word diagnose or diagnosis are used they shall include any undertaking by any method, device, or procedure whatsoever and whether gratuitous or not to ascertain or establish whether a person is suffering from any physical, mental, or nervous disorder. The law further provided that the terms shall specifically include the taking of a person's blood pressure and the use of mechanical devices or machines for the purpose of representing to any person any conclusion with respect to such person's physical, mental, or nervous condition.

Powers of Boards of Medical Examiners.—A Florida law amended the medical practice act by authorizing the board to pass on the good standing and reputability of any hospital and to determine those that maintain a standard of training sufficient to be recognized by the board when considering medical examinations given by the board. One California law amended the business and professions code by providing that every physician who while in attendance on patients is intoxicated to such an extent as to impair his ability to conduct the practice authorized by his certificate shall be guilty of a misdemeanor, and another amended the business and professions code by providing that the adjudication of insanity or mental illness or the voluntary commitment or admission to a state hospital of any licentiate for a mental illness shall operate as a suspension of his right to practice. A Florida law amended the medical practice act by making adjudication of insanity by a court of competent jurisdiction a ground for discipline. An Illinois law amended the medical practice act by permitting the suspension of a license to practice medicine on the entry of a decree by any court of competent jurisdiction establishing mental illness of any person holding a license under the medical practice act.

Internship.—An Oregon law amended the medical practice act by, among other things, providing that the one-year internship requirement be eliminated so that if, by reason of the national emergency, any shorter period of internship in a hospital approved for internship by the American Medical Association is served and the applicant thereafter completes the one-year period as a resident in such hospital or as a commissioned

medical officer of the armed forces, such applicant will be deemed to have fulfilled the internship requirement.

Examinations.—A California law amended the business and professions code relating to the subjects of examination for a physician's and surgeon's certificate by eliminating materia medica, pharmacology, and therapeutics and substituting therefor pathology—gross and microscopic.

Graduates of Foreign Medical Schools.—A California law amended the business and professions code relating to applicants for a physician's and surgeon's certificate whose application is based on a diploma from a foreign medical school by providing that in lieu of a one-year internship in a hospital approved by the board the applicant may have completed his final year of medical instruction in an approved medical school in the United States. A West Virginia law amended the medical practice act by admitting to the examination any person who shall have graduated from a medical school on or after Jan. 1, 1939, and who meets all the requirements of the law pertaining to education and training except that the medical school was not at the time of graduation a class A medical school as defined by statute.

Licensure Without Examination—Reciprocity.—New laws in Alabama, California, and Maine amend the medical practice act of their states with respect to the granting of reciprocity certificates to applicants applying for medical licensure.

National Board of Medical Examiners.—A Wisconsin law authorized the board of medical examiners to issue licenses to practice medicine and surgery or osteopathy and surgery and to accept, in lieu of its own examination, the certificate of the National Board of Medical Examiners.

Recording of Licenses and Fees Therefor.—A New York law amended the education law by requiring practitioners of medicine to register their certificates with the county clerk.

Preliminary Education.—A California law amended the business and professions code by providing that applicants for the physician's and surgeon's examination who graduate from school after Jan. 1, 1955, must present evidence of having completed a three-year resident course of college grade, including the subjects of physics, chemistry, and biology before commencing the study of medicine.

Temporary Licenses.—A Texas law amended the medical practice act by permitting the issuance of temporary licenses to be effective until the next regular meeting of the board. A Delaware law empowered the Medical Council of Delaware to issue temporary emergency certificates, limited to 12 months' duration and renewable at the discretion of the issuing authority, to physicians and surgeons licensed in another state whom they find qualified to practice during an emergency. The holder of such temporary certificate shall be privileged, during the term specified therein, to practice his profession in the state subject to such regulations, restrictions, and area limitations as the Medical Council may impose. One Illinois law amended the medical practice act by providing regulations for the issuance of temporary certificates of registration to persons who are nonresidents of the state, who have a Doctor of Medicine degree and who wish to pursue programs of graduate or specialty training in the state, and another authorized the department of registration and education to issue limited licenses to practice medicine to persons who have received training in a school of good standing with the board and who have been appointed a resident physician in a hospital maintained by the state to participate in a specialized training program. These limited licenses would entitle the physicians to practice medicine only in the hospital designated on the license. A Nevada law authorized the board of medical examiners to issue temporary licenses or permits granting applicants the right to serve as resident medical officers in any hospital in the state. They would not permit the holder to engage in the private practice of medicine. A New Hampshire law amended the medical practice act by authorizing the board of medical examiners to issue temporary five-year licenses to alien physicians who had taken out their first citizenship papers and are otherwise qualified. If the alien becomes a citizen during the five years he shall be issued a permanent license. A New York law provides that when the commissioner of health deems an emergency to exist in the department by reason of a lack of sufficient physicians, he may present evidence thereof to the Civil Service Commission, which may determine the existence of an emergency and waive the requirements of the civil service law as regards citizenship for physicians until such emergency ceases to exist. This waiver would apply only for physicians working with the department.

Veterans.—A California law amended the business and professions code by establishing regulations relating to the reinstatement of licenses of persons serving in the armed forces, and an Indiana law provided that persons lawfully inducted into the military service who were licensed to practice a profession in the state at the time of such induction may have six months after termination of their military service to apply for a renewal license without examination, reexamination, fine, or penalty.

Injunctions.—A Wisconsin law authorized the board of medical examiners and the board of chiropractic examiners to make use of the injunctive process to restrain violations of the respective laws, and an Oklahoma law authorized the use of the injunctive process to enforce the provisions of their respective acts by the board of chiropody, chiropractic examiners, medical examiners, optometry examiners, and osteopathic examiners.

Exemptions.—A Connecticut law amended the medical practice act by exempting chiropractors from the requirements thereof. A California law amended the business and professions code relating to qualifications for the practice of medicine by providing that the provisions applicable to applications by United States commissioned medical officers shall also be applicable to applicants who were in the armed forces of the United States during the period from Dec. 7, 1941, to Dec. 31, 1946, and who were bona fide residents of California prior to entering medical school. A Pennsylvania law authorized the state board of medical examiners to grant licenses to persons resident of the commonwealth who at the time of becoming members of the armed forces were in all other respects qualified according to law but were prevented from taking the examination by reason of their induction in the armed forces. A Florida law amended the medical practice act by exempting therefrom optometrists and pharmacists duly licensed by their own boards and also persons furnishing medical assistance in case of emergency. This law also required the registration of resident physicians, assistant resident physicians, and interns. A New Mexico law amended the medical practice act by providing that nothing therein should be construed to prohibit a physician who had been lawfully licensed to practice in another state from entering into a contract with a New Mexico state institution to serve as a member of the medical staff exclusively or from entering into a contract with an employer for the treatment of its employees only, provided such employer maintains a hospital for the benefit of its employees and provided the person submits proof that he has received a notification by the medical examining board of New Mexico that he possesses the necessary character and qualifications.

Interns and Resident Physicians.—A California law permitted hospitals to appoint graduates of approved schools as residents or assistant residents, and such persons may hold such positions for one year without obtaining a license to practice in the state.

Miscellaneous.—A Colorado law amended the medical practice act by, among other things, including two osteopaths on the medical examining board, and a Florida law made the records of the examining board prima facie evidence of the issuance of a license to any person or persons.

Rights and Privileges, Duties and Liabilities of Practitioners

Rights and Privileges.—A Florida law provided that all citizens and taxpayers of the county shall have the right to be admitted to any hospital or hospitals supported in whole or in

part by taxes collected in Bay County, Florida, and operated in that county, and in the management of such hospital or hospitals no discrimination shall be made against any physician or surgeon, provided such physician or surgeon has been admitted to the general practice of medicine or surgery under the laws of the state, and all such physicians or surgeons shall have equal privileges in treating patients in said hospital or hospitals. The law further provided that the board of trustees shall organize a staff of physicians and surgeons composed of every practicing physician and surgeon in the county, and such physicians and surgeons shall hold their position on said staff as long as they comply with the rules and regulations laid down by the Board of Trustees. An Ohio law provided for the issuance of special automobile licenses bearing the word "Physician" to persons holding unrevoked and unexpired licenses to practice medicine in the state. A Texas law provided that all practitioners of the healing art should indicate the system of the healing art which he is licensed to practice on any sign, pamphlet, letterhead, or the like. A Georgia law repealed an existing law imposing a tax on professions. A California law provided regulations relating to the sale of drugs, chemicals, and medicines but further provided that such regulations would not apply to the sale of sterilized sutures, hypodermic needles and syringes, medicinal gases, ether, chloroform, ethyl chloride, injectable anesthetics of the procaine series, sulfonamide creams, ointments and jellies used for introduction into the vaginal tract, where such sale is made to a physician, dentist, chiropodist, veterinarian, pharmacist, medical technician, or medical technologist, to a clinic, hospital, or other similar institution or to an exporter. A North Carolina law provided that, when it shall appear to the medical staff of a state institution that a patient is in need of some type of surgical operation for the preservation or restoration of health and no responsible relative can be located, the medical superintendent or the director of the institution, the surgical consultant, and the local health officer of the county in which the hospital or institution is located shall organize a board to pass on the physical condition of the patient and this board may by unanimous agreement authorize the necessary surgical operation, including the administration of an anesthetic.

Duties and Liabilities.—A Florida law provided that any doctor or other practitioner of the healing sciences making a physical or mental examination of any person shall, on the request of such person or his representative, furnish copies of all reports of such examination or treatment but that such report need not be furnished except on the written authorization of the patient or his representative. An Indiana law provided that all physicians shall report within 10 days to the state board of health in writing the name and address of any person diagnosed by him as having epilepsy or other similar disorder characterized by lapses of consciousness. A California law amended the business and professions code by making it a misdemeanor for a person to use the word "doctor" or abbreviations thereof or implying that he is a physician if he is not. A Nebraska law related to the commitment of persons to state institutions and provided that the petition accompanying the commitment of such person must be accompanied by the certificate of a legally qualified physician with experience in the actual practice of his profession, certifying that he has personally examined the person to whom the application relates and that in his opinion the person is feebleminded and a proper subject for commitment.

Compulsory and Voluntary Medical, Dental, and Hospital Service and Insurance Plans

Prepaid Medical and Hospital Care Plans.—One Illinois law provided regulations for the incorporation of voluntary health services plans corporations, and another Illinois law provided new regulations for the organization of nonprofit hospital service corporations. New laws in Kansas and Nebraska permitted nonprofit hospital and medical service corporations to enter into reciprocity agreements with plans in other states for the benefit of their subscribers. A West Virginia law provided, among other things, that hospital and medical nonprofit corporations must provide in their contracts that, in case of a deficit of available funds, each participating hospital or physician will accept a prorata share of available funds in full settlement of any bill submitted. A Maine law provided an enabling act for the regulation of nonprofit medical service plans. A Connecticut law permitted nonprofit medical service corporations to make payment for the professional services of dentists.

E. M. I. C.—A Minnesota law requested Congress to reenact the emergency maternity and infant care program for wives of men serving in the armed forces.

Accident and Sickness Insurance Disability Compensation.—A Michigan resolution created a special committee to study and investigate and report back to the general assembly the feasibility of disability insurance for the state of Michigan.

Health Insurance.—A Massachusetts law memorialized the Congress of the United States to vote against any legislation that may eventually subject what is now a free and self-reliant people to any form of compulsory health insurance or socialized medicine. A Texas resolution put the state legislature on record as opposing socialized medicine or compulsory health insurance and requested the Texas members of the House of Representatives and Senate of the Congress of the United States to resist legislation setting up socialized medicine or compulsory health insurance.

Workmen's Compensation and Occupational Disease Legislation

Choice of Practitioner.—A Delaware law amended the workmen's compensation act by providing that if an employer shall, on application made to him, refuse to furnish surgical, medical, and hospital services, medicines and supplies, the employee may procure the same and shall receive from the employer the reasonable cost thereof. A Missouri law amended the workmen's compensation act by providing that if an employee desires, he shall have the right to select his own physician, surgeon or other person at his own expense. A South Dakota law permitted injured employees to select their own physicians at their own expense.

Occupational Diseases.—A Florida law provided that any condition or impairment of health of municipal firemen caused by tuberculosis, hypertension, or heart disease would be presumed to have been suffered in line of duty unless the contrary is shown by competent evidence, provided that such firemen shall have successfully passed a physical examination on entering into such service that failed to reveal any evidence of such condition. A Pennsylvania law brought within the coverage of the Occupational Disease Act tuberculosis acquired by a nurse where the occupation involves exposure to such disease. A Utah law provided for the appointment of a medical panel with reference to total permanent disability and deaf cases arising from occupational disease. A Vermont law resulted in the enactment of an occupational disease statute.

Education, Experimentation, and Scientific Aspects of Medicine

Anatomic Acts, Disposition of Dead Bodies.—An Arizona law provided for the creation of an anatomy board for the purpose of distributing certain dead human bodies to qualified institutions and persons for the promotion and furtherance of the science and art of medicine and dentistry. One Florida law amended the law relating to trafficking in the dead body of a human being and provided that nothing in such law should be construed to prohibit the obtaining, dissecting, using, and disposing of dead bodies for the purpose of teaching or other appropriate university research by any medical school, dental school, school of nursing, or other university research or teaching unit that is a part of a regularly established or chartered institution of higher learning under the laws of the state, and another provided that whenever the dead body of a human being shall remain unclaimed by any relative of the deceased for 10 days after death, the board of county commissioners of the

county within which the body may be found shall have authority and power to give such body for any educational or research purpose to any medical school, dental school, school of nursing, or other college or university whether within or without the state of Florida. A Kansas law amended the law relating to the disposition of unclaimed dead human bodies and the use of such bodies by the department of anatomy of the medical school of the University of Kansas. A Wisconsin law provided that if a corpse is found in the Mendota State Hospital, the University of Wisconsin shall be notified that it may have such corpse; if the corpse is in the Winnebago State Hospital, Marquette University or any accredited school of mortuary science at Milwaukee shall be notified that it may have such corpse. A Nebraska law provided that it shall be unlawful for any person to throw away or abandon any dead human body, or any part thereof, in any place other than a regular place for burial and under a proper death certificate. A North Carolina law provided regulations whereby any person who may otherwise validly make a will may, by will, dispose of the whole or any part of his or her body to a teaching institution, university, college, state department of health, legally licensed hospital, or any other legally licensed hospital, agency, or commission operating an eye bank, bone or cartilage bank, a blood bank, or any other bank of a similar nature and kind designated for the rehabilitation of the maimed.

Animal Experimentation.—A California law authorized the state board of public health to make, promulgate, modify, amend, or rescind regulations for the control of the humane use of animals for the diagnosis and treatment of human and animal diseases, for research in the advancement of veterinary, dental, medical, and biological sciences, for research in animal and human nutrition and for the testing and diagnosis, improvement, and standardization of laboratory specimens, biologic products, pharmaceuticals, and drugs. An Illinois law provided that institutions requiring, for the effective carrying on of their scientific or educational activities, the use of live dogs or cats may apply to the state department of health for license to obtain animals from a public pound operated by or under contract with municipalities or other political subdivisions. An Oklahoma law provided regulations for the licensing of institutions desiring to obtain animals from established dog pounds for the purpose of investigation or instruction concerning the structure or functions of living organisms, the causes, preventions, control, or cure of diseases or abnormal conditions in human beings or animals. A South Dakota law provided regulations for the licensing of institutions by the state department of health, which institutions desire to obtain animals from establishments maintained by or for municipalities and to use such animals only in the conduct of scientific and educational activities. A Maine law authorized the commissioner to make rules and regulations and to issue permits to any person, firm, or corporation to take, have in possession, band, and transport wild birds and animals for scientific purposes.

Autopsies.—A Kansas law authorized a district judge to order the exhumation of a body of a deceased person for purposes of physical or chemical examination or analysis to determine the cause of death. A South Dakota law authorized the performance of autopsies by a physician or surgeon when authorized (*a*) by the decedent during his lifetime or (*b*) by the decedent's surviving spouse or if (*c*) the surviving spouse is incompetent or not available or if there is no surviving spouse by an adult, child, parent, brother, or sister of the deceased. A Tennessee law permitted counties to enter into contracts with institutions, public or private, to render scientific and medical assistance in connection with law enforcement problems. Contracts may provide for the performance of autopsies, chemical and biological laboratory examinations, toxicological examinations, etc.

Blood Plasma and Blood Banks.—A Maine law provided an appropriation for the purpose of supplying materials in connection with the accumulation, storage, and maintenance of 5,000 units of liquid plasma and 500 units of dried plasma to be available in the event of a disaster. A Michigan law provided for a uniform program of blood typing and the collection of whole blood and blood plasma and prescribed the powers and duties of certain agencies with respect thereto.

Contraception.—A Maryland law made it unlawful to sell contraceptives by means of a vending machine. A New York law provided that no appliances, drugs, or medicinal preparations intended for the prevention or treatment of venereal disease shall be displayed, sold, or otherwise disposed of except in places duly registered by the state board of pharmacy or in hospitals, clinics, dispensaries, or by duly licensed physicians. An Oregon law provided that mechanical contraceptives must bear the name and address of the distributor, the date of manufacture, and the brand name.

Coroners and Medical Examiners.—An Arkansas law established the office of state medical examiner and prescribed the powers and duties of the medical examiner with respect to investigation and autopsies. The head of the department of pathology at the University of Arkansas Medical School was designated as the state medical examiner, and he was directed to establish a laboratory having adequate facilities for the conduct of autopsies and of such pathological, bacteriological, and toxicological examinations as may be necessary or proper. Two Florida laws authorized the board of commissioners of certain counties to appoint county medical examiners and set forth the duties of such office. One Alabama law directed the state toxicologist to furnish a certified copy of any investigation that he conducted to the person ordering such investigation, and another Alabama law authorized a coroner to perform autopsies upon the bodies of persons who died by violence or other causes in order to ascertain or verify the cause of death, if the coroner is a physician or surgeon. Otherwise, the coroner must apparently obtain an order of the court and then appoint some physician or surgeon to perform the autopsy. A Florida law authorized certain judges and county solicitors throughout the state to secure the services of a physician in connection with the investigation of crime. A Maine law required physicians attending a person during the last illness to give the family, or the person conducting the burial, a statement as to the cause of death. A Minnesota law increased from $6 to $12 the fee of a physician called by a coroner to perform an autopsy. A New Jersey law authorized county physicians to perform autopsies or to direct some physician duly licensed in the state to do so when in the opinion of the county physician an autopsy is necessary to determine the cause of death.

Laboratories.—A Connecticut law directed the state department of health to maintain laboratories and bureaus of administration, vital statistics, preventable diseases, sanitary engineering, maternal and child hygiene, public health nursing, public health instruction, venereal disease, mental hygiene, and industrial hygiene. A Wisconsin law required certification by the state board of health of any laboratory established and operated to perform bacteriological, biological, serological, and related services. A Pennsylvania law authorized the state department of health to issue licenses to persons desiring to operate clinopathological laboratories, which were defined as places operated by one or more persons for the study of blood, urine, feces, and other secretions and excretions and parts of the human body, such as tumors removed for examinations in connection with the study of possible diseases in the living patient.

Medical Research Programs.—A West Virginia law created a revolving fund to be used for scientific and other research under contract with the federal government.

Medical Schools and Scholarships.—Laws authorizing the establishment of new medical schools were enacted in Florida, Maine, North Dakota, and West Virginia. New laws in Massachusetts and Rhode Island created special committees to make a thorough study concerning the feasibility of establishing a medical school at Rhode Island State College. An Illinois resolution requested an amendment to the rules of the College of Medicine of the University of Illinois in order to provide for the annual admittance of at least 20 students who will agree to practice in the rural areas of the state. A Georgia law pro-

vided that there shall be submitted to the voters of the state a resolution recommending the creation of a state medical education board to receive and pass upon, allow, or disallow applications for loans or scholarships made by students who are bona fide citizens and residents of the state and who desire to become doctors of medicine and who are acceptable for enrollment in a qualified four-year medical school. A Texas law proposed an amendment to the Constitution providing for the establishment of a state medical education board and a state medical scholarship fund, from which grants, loans, or scholarships may be made to students desiring to study medicine, providing such students shall agree to practice in rural areas of the state.

Paternity Tests.—A Pennsylvania law provided that in any proceeding to establish paternity, the court on motion of defendant shall order the mother, her child, and the defendant to submit to one or more blood grouping tests by a duly qualified physician to determine whether the defendant can be excluded as being the father of the child and that the results of such tests may be received in evidence in cases where definite exclusion of the defendant is established.

Miscellaneous Legislation

Antidiscrimination.—An Oregon law made it unlawful for any professional school chartered or licensed in the state to refuse admission to or to discriminate in admission against or to discriminate in giving instruction to any person otherwise qualified on the ground of such person's race, color, religion, or national origin.

Multiple Boards of Health.—Laws permitting the establishment of consolidated or multiple county health departments were enacted in New Jersey, Pennsylvania, South Dakota, and Wyoming.

State Boards of Health.—New laws relating to the powers of the state board or department of health were enacted in Arizona, Delaware, South Dakota, Utah, and Vermont and a Maryland law permitted chiropractors to receive free services along with physicians from the public health laboratory.

Surveys.—A Minnesota law provided for the creation of a commission to make a survey of the manner in which responsibility for the treatment and control of tuberculosis is now shared in the state as well as a survey of the facilities for the diagnosis, treatment, and control of tuberculosis in the state. A New York law created a legislative committee to make a study and survey of the social, educational, and physical problems of persons affected with cerebral palsy. A Wisconsin law provided an appropriation for the study of and research into the causes, prevention, and cure of rheumatism and arthritis and for the purchase of necessary apparatus, equipment, and supplies to carry out such study and research. A Michigan law provided an appropriation to tuberculosis hospitals and provided for conducting a survey of the state as far as its need for hospital services is concerned. A number of other laws relating to various types of surveys were enacted during the last legislative season. The following committees and studies were provided for: California—a temporary committee to study voluntary plans of hospital and health insurance and prepaid medical, surgical, hospital, and other services respectively; an interim committee to study and analyze all matters relating to or affecting public health; a committee to study and analyze all facts relating to a shortage of nurses. Georgia—a committee to investigate the procedure for admission now in effect at the university school of medicine to determine if Georgia boys and girls are given preference in being admitted to such school over out-of-state students. Illinois—a committee to study the need for the establishment of a hospital in Chicago for the treatment of patients with acute mental disease; a special committee to investigate why the city of Chicago has not utilized the facilities of the Municipal Contagious Disease Hospital for the treatment of persons afflicted with tuberculosis. Maryland—a committee to review the Maryland mental health program. Massachusetts—a study and investigation relative to the advisability of providing psychiatric services and facilities to the district courts; a commission to make a study relating to the sentencing, treatment, and release of female prisoners in penal institutions; a study by the committee on public health relative to the licensing of certain hospitals and nursing homes, relative to the matter of handling and disposing of radioactive materials and the use of apparatus emitting ionizing radiation and relative to regulating the practice of electrolysis. Michigan—a committee to study the laws of the state governing drug addicts. Minnesota—a commission to study and analyze all the facts and matters relating to youth conservation and mental health programs in the state. Ohio—a committee to make inquiries pertaining to the state examining boards. South Carolina—a committee to investigate unemployment insurance rates. Tennessee—a commission to study and investigate plans to provide hospitalization and medical care and treatment for indigent and sick persons financially unable to provide the same. Vermont—a commission to investigate the conditions existing at the Vermont state hospital. Wisconsin—a committee to study the problem of need for medical facilities and personnel in needy areas of the state, with special emphasis on the possibilities of establishing community clinics in such areas; a committee to survey the sanitation and safety problems of the public schools.

Taxes.—A Minnesota law authorized the deduction under the state income tax law of premiums paid for hospitalization and health and accident insurance.

Microfilms.—An Alabama law authorized the commissioner of public welfare to microfilm his records and provided that such microfilms would be admissible evidence in court. A New York law also permitted the use in court of photographic reproductions of hospital records.

Vendor of Medical Care.—A Minnesota law defined the term vendor of medical care to mean any person furnishing within the scope of his respective license any or all of the following goods or services: medical, surgical, hospital, optical, dental, nursing services, drugs and medical supplies, appliances, laboratory, diagnostic, and therapeutic services, nursing home and convalescent care, and such other medical services or supplies provided or prescribed by persons authorized by state law to give such services and supplies.

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

RESIDENCY INFORMATION SERVICE

A list of residency appointments available in approved hospitals through Jan. 1, 1953, is now ready for distribution and will be furnished to interested physicians and institutions on request. These lists provide information regarding the number of positions open, date available, the name of the chief of service, the stipend paid, maintenance furnished, and the name of the person to whom application should be made; in addition, the lists indicate those hospitals that will consider applications from graduates of medical schools outside the United States. The lists are classified by specialties. Unless the complete reprint is requested, therefore, a list of available positions in a particular specialty or specialties will be furnished. Physicians desiring this information should indicate the specialty or specialties in which they are interested.

It should be noted that this service is made available directly to prospective applicants on their request and is not published in THE JOURNAL. Complete data on all approved services will continue to be published in the Internship and Residency Number of THE JOURNAL. Physicians and institutions wishing to utilize this service, either to secure a list of available appointments or to list positions open in subsequent revisions, should write to: Residency Information Service, 535 North Dearborn Street, Chicago 10, Ill.

MEDICAL LITERATURE ABSTRACTS

UNITED STATES

A.M.A. Arch. Indust. Hyg. & Occup. Med., Chicago

5:97-184 (Feb.) 1952

CONFERENCE ON PROBLEMS OF NOISE IN INDUSTRY

Sound and Its Measurement. L. L. Beranek.—p. 97.
Industrial Plant Environmental Study. C. R. Williams.—p. 109.
Estimating Percentage Loss of Hearing. H. A. Carter.—p. 113.
Noise Safety Criteria. K. D. Kryter.—p. 117.
Ear Lesions Caused by Acoustic Trauma. S. R. Guild.—p. 121.
Clinical Aspects of Problems of Noise in Industry. H. P. House.—p. 124.
Noise and Noise Reduction: Control Methods Applied. W. D. Boynton. —p. 129.
Legal Aspects of Occupational Deafness. N. S. Symons.—p. 138.
Medical and Legal Aspects of Noise in Industry: Discussion of Papers Presented. G. D. Hoople.—p. 157.
Summary of Conference on Problems of Noise in Industry. W. A. Rosenblith.—p. 160.

A.M.A. Arch. Neurology and Psychiatry, Chicago

67:135-268 (Feb.) 1952

SYMPOSIUM ON BRAIN AND MIND

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Ascending Reticular Activating System in Brain Stem. H. W. Magoun. —p. 145.
Corticofugal Projections to Brain Stem. H. Jasper, C. Ajmone-Marsan and J. Stoll.—p. 155.
Nature and Locus of Mind. S. Cobb.—p. 172.
Memory Mechanisms. W. Penfield.—p. 178.
Consciousness Reconsidered. F. Schiller.—p. 199.
*Blood Eosinophilic Leucocytes in Mental Disease. M. D. Altschule, E. P. Siegel, R. M. Restaino and B. H. Parkhurst.—p. 228.
*Cerebellar Hemangioblastomas: Review of 53 Cases, with Special Reference to Cerebellar Cysts and Association of Polycythemia. F. Cramer and W. Kimsey.—p. 237.

Blood Eosinophils in Mental Disease.—Altschule and associates made blood eosinophil counts on 25 normal subjects, 244 patients with untreated mental disturbances, and 118 patients who were treated with insulin or electroshock. The influence of pregnancy on the eosinophil count was studied in 2 women, and the effects of intramuscular injection of 0.01 mg. of epinephrine hydrochloride per kilogram of body weight were studied in 44 patients with various disorders. It was found that the eosinophil count of venous blood is usually low in patients with severe neuroses or manic depressive, involutional, or schizophrenic psychoses; when these conditions are of long duration, the counts are less likely to be low. After treatment with insulin or electroshock therapy, the count usually rises in patients who show improvement and usually does not change significantly in patients who do not. Several sources of error prevent the use of the blood eosinophil count as a diagnostic aid or as an indicator of the adequacy of shock treatment. The eosinophil counts in the two psychotic pregnant women were in the range described by others for nonpsychotic pregnant women. The eosinopenic response to epinephrine in the patients with mental disorders was similar to that found in many other chronic illnesses; treatment has no consistent effect on this reaction. The authors feel that the results of their studies are consistent with the concept that severe neuroses and schizophrenic, manic depressive, and involutional psychoses are associated with an increase in some adrenocortical functions and that recovery is associated with depression of these functions. Whether the changes found result from the disease or from a factor that is the cause of the mental disease has not been established.

Cerebellar Hemangioblastomas.—Cushing and Bailey believed that xanthochromic cysts of the cerebellum that were not definitely associated with gliomas were of hemangioblastomatous origin. To establish their relation to hemangioblastomas, Cramer and Kimsey analyzed the cerebellar cysts they observed over the past 20 years, including 48 surgically verified cerebellar hemangioblastomas or hemangioblastomatous cysts and 5 disclosed at autopsy. Over 80% of the patients were between 20 and 50 years of age. The tumors were classified as "solid," "solid with cysts," and "cysts." Symptoms of increased intracranial pressure predominated, headache being the first symptom in over 90% of the cases. Headache was associated more frequently with solid tumors than with cysts. Papilledema was found in 40 cases. Cerebellar signs, such as ataxia, adiadochokinesia, and unsteady stance, were third in frequency. Vomiting occurred in 29 cases, and papilledema was present in 27 of these. Vertigo occurred in 25 and tinnitus in 8 cases. A total of 70 operations were performed in the 48 patients, the operations being multiple in 12 cases. The mortality in single stage operations was 8.3%, and in multiple stage operations, 18.1%. The histories of patients undergoing multiple stage operations are presented, because they permit a view of different stages of the cystic cerebellar hemangioblastoma. In relatively few cases, the stigmas were associated with the von Hippel-Lindau syndrome, the incidence being about the same as in Cushing and Bailey's series. The length of survival and freedom from symptoms is directly proportional to the degree of removal of the tumor, and possibly to the degree of removal of the cyst wall. The cerebellar hemangioblastomas arise from multicentric anlages. Recurrence of symptom is often due to the growth of new tumors. The recurrence of symptoms after the complete evacuation of a cyst with no mural nodule and the finding of another cyst subsequently are probably due to the growth, degeneration, and/or exudation from vessels of another tumor, and not to the simple refilling of the first cyst. The sudden recurrence of symptoms in the course of a hemangioblastoma may be a sign of acute hemorrhage into the cerebellum. The association of polycythemia rubra with vascular tumors suggests that the polycythemia may result from hematopoietic functions of these hemangioblastomas. However, it may represent merely a diathesis toward extramedullary erythropoiesis in the spleen and liver. Future observations on this type of tumor must include more extensive studies on the red blood cells in the general circulation, as well as on those within the hemangioblastomas. Tissue cultures in one case here reported gave suggestive evidence of erythropoiesis.

A.M.A. Arch. Otolaryngology, Chicago

55:101-260 (Feb.) 1952

Diagnosis of Deafness in the Very Young Child. F. R. Guilford and C. O. Haug.—p. 101.
Loudness Perception for Pure Tones and for Speech. J. D. Harris, H. L. Haines and C. K. Myers.—p. 107.
Structure and Function of Cochlear Aqueduct. J. Lempert, P. E. Meltzer, E. G. Wever and others.—p. 134.
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Mastoidectomy: New Supra-Auricular Approach to Middle Ear. E. Gutteridge.—p. 163.
Congenital Atresia of Auditory Canal: Two-Stage Operation with Fenestration. D. G. Woodman.—p. 172.
Intranasal Encephaloceles: Survey of Problem, with Recommendations for Reducing Mortality. E. Walker, W. W. Moore and J. R. Simpson. —p. 182.
Notes on Innervation of Cochlea. E. Bocca.—p. 188.
Chronic Progressive Deafness, Including Otosclerosis and Diseases of Inner Ear. A. L. Juers, E. L. Derlacki and G. E. Schambaugh Jr. —p. 218.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individual subscribers, provided they reside in continental United States or Canada. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover only the last 11 years, and no photoduplication services are available. No charge is made to members, but the fee for other borrowers is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted.

A.M.A. Arch. Pathology, Chicago

53:103-196 (Feb.) 1952

Granulomatous Encephalomyelitis in Infancy. J. P. Wyatt and W. W. Tribby.—p. 103.
Dissecting Aneurysm of Aorta: Pathologic Aspects; Analysis of 85 Fatal Cases. I. Gore and V. J. Seiwert.—p. 121.
Pathogenesis of Dissecting Aneurysm of Aorta. I. Gore.—p. 142.
Accumulation of Fat in Liver with Deficiencies of Threonine and of Lysine. F. Dick Jr., W. K. Hall, V. P. Sydenstricker and others. —p. 154.
Ovarian Stromal Hyperplasia in Breast Cancer. S. C. Sommers and H. A. Teloh.—p. 160.
*Mycosis of Cervical Spinal Cord Following Intrathecal Penicillin Therapy: Report of Case Simulating Cord Tumor. R. E. Wybel.—p. 167.
Rachitic Changes in Vertebral Bodies. R. C. Hendrix.—p. 174.
Alkaline Phosphatase Activity of Kidney Following Experimental Shock in Dogs by Clostridium Perfrigens Toxin. M. Berg and S. A. Levinson. —p. 179.

Mycosis of Spinal Cord Following Intrathecal Therapy.—Mycotic infections have been observed in patients treated with antibiotics. Wybel reports a fatal case of mycotic granuloma of the leptomeninges of the cervical spinal cord that was probably due to Aspergillus. The clinical course simulated that of a spinal cord tumor. The fungus may have been introduced as a contaminant during treatment of a pneumococcic meningitis with intrathecal injections of penicillin three years prior to death. It is believed that this is the first reported case of mycotic infection of the meninges associated with or following the intrathecal administration of penicillin. Evidence is cited from the literature that indicates that the growth of the fungus was enhanced by the penicillin therapy. This complication should be added to the long list of dangers associated with the intrathecal administration of penicillin and other antibiotics.

Alabama State Medical Assn. Journal, Montgomery

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Efficacy of Various Solutions Used in Injection Treatment of Internal Hemorrhoids. M. H. Dodson.—p. 227.
Surgery in Treatment of Pulmonary Tuberculosis. J. P. Chapman Jr. —p. 230.
Method of Treating Paraphimosis. T. H. Williams and R. K. Nichols. —p. 233.

American Heart Journal, St. Louis

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Cardiac Involvement in Progressive Muscular Dystrophy. S. Weisenfeld and W. J. Messinger.—p. 170.
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Alterations of Rapid Filling Phase in Congestive Heart Failure. H. E. Heyer, C. H. Howard, K. W. Willis and A. C. Pickle.—p. 206.
Water and Electrolyte Content of Cardiac and Skeletal Muscle in Heart Failure and Myocardial Infarction. L. T. Iseri, L. C. Alexander, R. S. McCaughey and others.—p. 215.
Variation of P-R Interval in Sinus Arrhythmia and Its Possible Relation to Wenckebach Phenomenon. O. F. Ehrentheil, M. M. Alimurung and B. F. Massell.—p. 228.
Positional Changes in QAVF and Esophageal Leads Induced by Pneumoperitoneum. I. L. Rubin and W. Most.—p. 236.
Intraventricular Pressure and Electrocardiographic Recordings of Dying Rabbit Heart. F. R. Franke, R. S. George and S. Cohen.—p. 246.
*Use of Pharmacological Tests in Diagnosis of Pheochromocytoma. W. H. Anderson, L. S. Rolufs and A. A. Doerner.—p. 252.
*Intra-Arterial Infusion in Treatment of Shock Resulting from Coronary Occlusion. E. F. Berman and L. C. Akman.—p. 264.
Isolated Traumatic Rupture of Interventricular Septum Due to Blunt Force. B. E. Pollock, R. A. Markelz and H. E. Shuey.—p. 273.
Rheumatic Carditis in Surgically Removed Auricular Appendages. M. Kuschner, I. Ferrer, R. M. Harvey and R. H. Wylie.—p. 286.

Pharmacologic Tests in Pheochromocytoma.—The diagnosis of pheochromocytoma in a man aged 35 was suggested by the almost daily recurrence of severe throbbing frontal headache, blood pressure of 190/128 mm. Hg, an increase in blood pressure to 230/150 mm. Hg following massage in the left upper quadrant of the abdomen, albuminuria (410 mg. per 100 cc.), and a fasting blood sugar level varying from 85 to 136 mg. per 100 cc. Excretory urography revealed poor function on the left side. The diagnosis of pheochromocytoma was established preoperatively by pharmacologic tests. The benzodioxane test was carried out twice, with 20 mg. of the drug given intravenously, and was negative on each occasion. It may be that the benzodioxane was not injected at a time when the patient manifested an excess of circulating epinephrine. This suggestion is supported by the fact that benzodioxane depressed the blood pressure following tumor manipulation at operation. The histamine test was strongly positive, the reaction to the intravenous injection of 0.025 mg. being more severe than any spontaneous attack. The tetraethylammonium chloride test was performed twice. The patient first was given 100 mg. doses intravenously at two minute intervals until 400 mg. had been given. This was followed by a drop of 20 mm. in the systolic blood pressure and of 10 mm. in the diastolic. The following day he was given 400 mg. intravenously in a single injection and a typical pressor response followed, with maximal effect four minutes after the injection. These observations supported the concept that tetraethylammonium chloride potentiates both pressor and depressor substances due to block of sympathetic ganglions and the carotid and aortic regulatory ganglions. The result of the methacholine (mecholyl®) chloride test was negative, as was the cold pressor test. The amobarbital sodium sedation test was carried out by giving 7½ grains (0.5 gm.) of amobarbital sodium orally; the pressure dropped in one hour from 160/80 to 135/78 mm. of mercury. Since the pharmacologic tests confirmed the clinical impression, the patient was operated on and a tumor was found at the upper pole of the left kidney partially surrounded by adrenal tissue. It was successfully removed, and microscopic examination revealed a benign pheochromocytoma of the adrenal gland. It is concluded that a battery of pharmacologic tests has a useful place in the diagnosis of pheochromocytoma.

Intra-Arterial Infusion in Treatment of Shock.—Eight patients between the ages of 47 and 78 in severe to profound shock of from three to 28 hours' duration following myocardial infarction from coronary occlusion were treated with intra-arterial infusion. Up to 1,000 cc. of blood or plasma were given at a rate, generally, of 75 to 100 cc. per minute. Six of these patients showed evidence of improvement as manifested by the heart sounds, respirations, degree of pain, and electrocardiographic tracings. Elevation of blood pressure occurred in four patients in whom infusion seemed effective in enabling them to survive critical periods of shock for eight hours, 11 and 14 days, and 10 months. There was no increase in pulmonary congestion during the infusion, but one patient developed ventricular fibrillation shortly after infusion. Results improved as greater facility in technique was achieved. Arterial hypotension is the only constant clinical feature of coronary shock. Congestive heart failure may or may not be present, but its frequent presence or appearance emphasizes the limited reserve of the circulatory system under these conditions. Intra-arterial infusion in myocardial infarction is less likely than intravenous infusion to increase or precipitate congestive heart failure. Its applicability does not depend on the venous circulation, nor does it abrogate steps in correcting venous dynamics. Intra-arterial infusion, in addition to combating shock with the least volume of fluid, has the singular action of increasing coronary flow by retrograde effect. The authors' results seem to justify the use of intra-arterial infusion in patients with postcoronary hypotension who have not progressed to such profound shock and imminent death as those reported on. Although the limited experience with intra-arterial infusion in coronary shock seems encouraging, the extremely serious nature and depleted reserve of the patients call for utmost caution in its application.

American Journal of Psychotherapy, New York

6:1-242 (Jan.) 1952. **Partial Index**

Observations on Obsessive-Compulsive Behavior. N. Roth.—p. 7.
Insecurity in Search of Security. B. Karpman.—p. 23.
Anti-Psychoanalytic Cultural Forces in Development of Western Civilization. S. Arieti.—p. 63.
Early Married Life. D. J. Salfield.—p. 79.
Psychological Effects of School Segregation. F. Wertham.—p. 94.
Limitations of Teacher in Guidance. S. Baron.—p. 104.

Journal Clin. Endocrin. & Metab., Springfield, Ill.

12:1-142 (Jan.) 1952

Comparison of Effectiveness of Three Testosterone Preparations in Man and Rats. E. P. McCullagh, J. B. R. McKendry and C. A. Schaffenburg.—p. 3.
Testosterone β-Cyclopentylpropionate: New Long-Acting Androgen. A. C. Ott, M. H. Kuizenga, S. C. Lyster and B. A. Johnson.—p. 15.
Relative Duration of Action of Natural and Synthetic Estrogens Administered Parenterally in Women with Estrogen Deficiency. J. Ferin.—p. 28.
Eosinophil Response to Stress of Patients with Surgically Produced Thalamic and Hypothalamic Lesions. W. H. Perloff, L. M. Levy and A. Despopoulos.—p. 36.
Hormone-Resistant Psychogenic Amenorrhea. M. A. Goldzieher and J. W. Goldzieher.—p. 42.
Adrenal Cortical Tumor Causing Hirsutism Without Other Evidence of Virilization. L. W. Kinsell and H. Lisser.—p. 50.
Determination of Urinary Steroids: I. Preparation of Pigment-Free Extracts and Simplified Procedure for Estimation of Total 17-Ketosteroids. I. J. Drekter, A. Heisler, G. R. Scism and others.—p. 55.
Clinical Method for Chromatographic-Colorimetric Determination of Urinary 17-Ketosteroids: II. Normal Adults. E. Dingemanse, L. G. Huis in 't Veld and E. L. Hartogh-Katz.—p. 66.
Critical Analysis of Quantitative I^{131} Therapy of Thyrotoxicosis. A. S. Freedberg, G. S. Kurland, D. L. Chamovitz and A. L. Ureles.—p. 86.
*Treatment of Nodular Goiter. L. Hermanson, S. L. Gargill and M. F. Lesses.—p. 112.
Present Status of Treatment of Toxic Goiter. W. O. Thompson.—p. 130.

Treatment of Nodular Goiter.—In this study of data on 200 patients operated on for nodular goiter, it was possible to determine the exact degree and extent of the nodularity in 190. In 137 patients the goiter was judged clinically to contain a solitary nodule, but complete examination of the excised specimen revealed that 43 of these goiters were multinodular. Both single and multiple nodules were found in 18 clinically nonnodular thyroid glands. This throws considerable doubt on the clinical differentiation of solitary from multinodular goiter. The incidence of malignant neoplasms was 12.5% in the entire series; 14.4% of the solitary nodules were malignant neoplasms. In 10.4% of the patients with multinodular goiters, malignant neoplasms occurred in one or more of the nodules. Thyroid cancer occurred as an unexpected finding in patients with asymptomatic nodular goiter. Twenty-five patients with malignancy of the thyroid were followed for periods of from one to 17 years; 21 of these patients had papillary carcinoma or angioinvasive adenoma. Only two patients died during a follow-up period that averaged seven years. Routine radical neck dissection in thyroid cancer does not appear to be justified. Adequate surgery should consist of unilateral total lobectomy or bilateral thyroidectomy, depending on the nature and extent of the lesion. Radical neck dissection is indicated when there is transcapsular spread. Injuries to the recurrent laryngeal nerves occur in a significant number of operations for nodular goiter, and are related to the type of operation performed.

Journal of International College of Surgeons, Chicago

17:135-270 (Feb.) 1952

Surgical Management of Secondary and Absolute Glaucoma, with Special Reference to Cycloelectrolysis. C. Berens and L. J. Girard.—p. 135.
Menacing Specter of Chronic Aural Suppuration. F. L. Lederer.—p. 154.
Maxillofacial Triad and Its Correction, with Special Reference to Nasal Septum. I. B. Goldman.—p. 167.
Effects of Surgery of Inferior Oblique Muscle on Lateral Deviation. W. E. Krewson III.—p. 181.
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Superficial Keratectomy: Technic of Corneal Resection for Restoration of Vision with Use of Binocular Dissecting Microscope. R. A. Perritt.—p. 220.
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Diseases of Nose and Nasal Accessory Sinuses in Relation to Eye. L. Savitt.—p. 227.
Ophthalmologic Developments Under Field and War Conditions. R. I. Pritikin.—p. 234.
Otorhinologic Surgical Problems in Biochemical Era. S. F. Kelley.—p. 240.

Journal of Investigative Dermatology, Baltimore

18:1-86 (Jan.) 1952

*Adrenocorticotrophic Hormone in Severe Anogenital Pruritus. J. L. Fromer and F. E. Cormia.—p. 1.
Results of Skin Tests in Contacts of Blastomycotic Patients. J. Schwarz and G. L. Baum.—p. 3.
*Treatment of Alopecia Areata Totalis and Universalis with Cortisone Acetate. C. J. Dillaha and S. Rothman.—p. 5.
Some Endocrine Aspects of Skin Senitizations and Primary Irritation. A. Nilzen.—p. 7.
Studies on Peripheral Vascular Physiology of Patients with Atopic Dermatitis. W. H. Eyster Jr., G. M. Roth and R. R. Kierland.—p. 37.
Effect of Ions on Melanin Formation. A. B. Lerner.—p. 47.
Attempts at Passive Transfer of Allergic Eczematous Sensitivity in Man. R. L. Baer and M. B. Sulzberger.—p. 53.
New Clearing Method Permitting Same Specimen to be Examined Microscopically for Pathogenic Fungi and Directly Inoculated into Culture Media. E. H. Mandel, E. Muskatblit, A. G. Franks and F. Herrmann.—p. 61.
Studies on Sweating: V. Studies of Quantity and Distribution of Thermogenic Sweat Delivery to Skin. F. Herrmann, P. H. Prose and M. B. Sulzberger.—p. 71.

Adrenocorticotropic Hormone in Anogenital Pruritus.—The first of the four patients in whom adrenocorticotropic hormone was tried had had anogenital pruritus for 20 years. Various treatments, including the use of local medication, antihistaminic agents, and roentgen rays, had proved ineffective. Treatment with corticotropin was begun with a dose of 100 mg. daily for three days, then 50 mg. daily for three days, and after that a maintenance dose of 10 mg. The pruritus showed improvement within 24 hours after the onset of treatment and subsided completely after three days. There was no recurrence during the four months that have elapsed since then. In the three other patients the immediate effect of corticotropin was equally favorable, but one of these patients had a relapse after two months. The author is unable to explain the mode of action of corticotropin in anogenital pruritus.

Cortisone Acetate in Alopecia Areata.—The following observations have suggested that hormonal factors may play an accessory role in alopecia areata: regrowth of hair during pregnancy and recurrence of alopecia with reestablishment of the menses; the onset of alopecia sometimes concurrently with thyrotoxicosis; and the fact that it is more severe if it begins before puberty. The reasoning that led Hench and associates to the use of corticotropin and cortisone in rheumatoid arthritis prompted the present authors to try cortisone in patients with alopecia areata. They found that three of four patients with long-standing alopecia areata responded to oral treatment with cortisone acetate. In the one patient who did not respond, the disease had appeared before puberty. In the other three patients new hair began to grow after four weeks of treatment. This uniformity of response, as well as the fact that the disease in all three cases was present for five or more years without any tendency to spontaneous remission, is regarded as proof that the regrowth was coincident with therapy. All three patients are still under treatment, and hair growth is progressing.

Journal of Neurosurgery, Springfield, Ill.

9:1-114 (Jan.) 1952

*Fat Embolism: Problem in Differential Diagnosis of Craniocerebral Trauma. R. C. Schneider.—p. 1.
*Study of Causes of Failure in Herniated Intervertebral Disc Operation: Analysis of 67 Reoperated Cases. J. Greenwood Jr., T. H. McGuire and F. Kimbell.—p. 15.
Procaine Block of Frontal Lobe White Fibers as Means of Predicting Effect of Prefrontal Lobotomy: I. Experimental Studies. O. T. Bailey, W. T. Small and F. D. Ingraham.—p. 21.
Id.: II. Clinical Evaluation. W. P. Van Wagenen and C. T. Liu.—p. 30.
Recovery from Decerebrate State Associated with Supratentorial Space-Taking Lesions. H. Freedman.—p. 52.
Hydrocephalus from Overproduction of Cerebrospinal Fluid (and Experiences with Other Papillomas of Choroid Plexus). E. A. Kahn and J. T. Luros.—p. 59.
Effects of Intracarotid Diodrast. E. L. Foltz, L. B. Thomas and A. A. Ward Jr.—p. 68.
Tissue Reactions to Powdered Tantalum in Central Nervous System. O. T. Bailey, F. D. Ingraham, P. S. Weadon and A. F. Susen.—p. 83.

Fat Embolism and Craniocerebral Trauma.—Fat embolism must be considered in patients who have received lacerations or long bone fractures concomitantly with head injuries. Within six months Schneider observed three patients with fat embolism. In addition to fracture of long bones, the tentative diagnoses in

these cases were extradural hemorrhage, subdural clot, and midbrain injury, respectively. In the first of the three cases mental confusion and lethargy occurred about 12 hours after the accident and a short time after a cast had been applied to the leg, suggesting the possibility of emboli. Fat globules were found in the urine 60 hours after the accident. Nine days after the injury temperature elevation with tonic seizures of the extremities indicated the release of another shower of fatty emboli to the brain stem or the vicinity of the basal ganglia. A dilated right pupil with bilateral extensor plantar reflexes suggested the formation of a tentorial pressure cone due to a rapidly expanding right temporoparietal extradural hematoma. If such a case is observed until there are changes in vital signs, the patient may succumb before operation can be performed. Therefore, trephination was indicated despite a diagnosis of fat embolism, because extradural hematoma and fat embolism might coexist. The history of the second case suggested the presence of a subdural hematoma over the left hemisphere. However, other signs suggested that the lesion was diffuse rather than localized. Because of the fracture of the left humerus and the author's experience in the first case, the urine was tested for fat droplets, and the diagnosis of fat embolism was confirmed Thus the patient was spared unnecessary trephination. The third patient had a neurological pattern suggesting midbrain damage, although the same pattern may be seen in cases in which petechial hemorrhages have occurred in the region of the basal ganglia. In this case the treatment was the same for the lesion due to trauma as for diffuse fat embolism. The latter diagnosis was suspected, but could not be demonstrated until postmortem examination. After discussing the signs, symptoms and laboratory test for fat embolism, the author says that the most important point is to think of fat embolism. If there is any doubt about an intracranial clot and cerebral fat embolus, trephination should be carried out.

Failure in Disk Operations: Analysis of Cases with Second Operations.—Of 632 patients operated upon by Greenwood and associates for herniated disk, 58 had second operations. Nine others who had a second operation received their first surgical treatment elsewhere. This total of 67 includes 10 patients reoperated on while they were still in the hospital and 16 who had a second herniation in an entirely different location. Many were operated on after several years of complete relief before recurrence of pain necessitated a second procedure. Thus in only 32 cases can the need for a second operation be ascribed to failure of the first operation. A review of these 67 cases showed that the operation for lumbar disk herniations is not primarily an operation on the disk injury, but an operation on the nerve roots involved. Reoperation is a worth-while procedure if this fact is recognized, and will further reduce the small group of failures. In addition, knowledge gained may reduce the number of patients who obtain incomplete relief and need a second procedure. It is emphasized that the opening through which the nerve root must pass should be at least 50% larger than the root itself; that there should be no loose pieces of cartilage left behind, above, or below the interspace, attached to the nerve root or in the intervertebral foramen; and that no nuclear material should be left in the intervertebral space. Bony prominences should be removed, or, better, gently hammered down. The results of nerve root section are fairly good. While the success of fusion is unimpressive, fusion should be done if no other direct approach seems reasonable. The worst results were obtained in cases in which there was persistent or recurrent back pain without sciatic pain.

Kentucky State Medical Assn. Journal, Bowling Green

50:1-50 (Jan.) 1952

Status of Total Gastrectomy in Treatment of Gastric Cancer. C. C. Johnston.—p. 1.
The Eye, the Patient, and the Physician. W. L. Adams.—p. 5.
Current Concepts in Management of Chronic Pelvic Inflammatory Disease with Review of Literature. G. G. Greene.—p. 8.
Use of Intramedullary Nail. G. E. McMunn.—p. 14.
*Vagotomy and Pyloroplacty: Simple Safe Solution to Bleeding Ulcer Problem. H. E. Dorton, J. G. Webb and D. M. Royalty.—p. 16.
Cough. O. O. Miller.—p. 19.

Vagotomy and Pyloroplasty for Bleeding Ulcer.—Dorton and associates used vagotomy combined with pyloroplasty in the surgical management of 10 patients who had bleeding duodenal ulcers. The results were most satisfactory. There was no surgical mortality, and there has been no recurrence of bleeding or of ulcer symptoms for an average follow-up period of 18 months. The authors feel that vagotomy and pyloroplasty is a simple, safe, and effectual method of managing any type of duodenal bleeding ulcer. It will not only control acute bleeding but also will cure the ulcer and thereby prevent subsequent bleeding. A patient who has massive hemorrhage should be considered an acute surgical emergency to be operated on as soon as provision for adequate blood substitution has been made. To wait in the hope that bleeding from a good-sized artery will stop spontaneously is dangerous. Vagotomy and pyloroplasty is the operation of choice for this condition.

Maine Medical Association Journal, Portland

43:1-30 (Jan.) 1952

Surgical Aspects of Thyroid Disease. E. S. Judd Jr.—p. 1.
Review of Fifty Cholecystectomies. P. O. Gregory.—p. 8.
Notes on Intracranial Hemorrhage in the Newborn. G. E. Dash.—p. 13.
Routine X-Ray Examination in Obstetrics: Why and How We Do It. J. P. Goodrich and P. O. Gregory.—p. 15.
Giant Tumor of Breast. P. O. Gregory and I. I. Goodof.—p. 17.

43:31-64 (Feb.) 1952

Old Age. G. J. Robertson.—p. 31.
The Pigmented Naevus of the Conjunctivae and Its Importance to the Individual. R. H. Dennis.—p. 35.
Rational Approach to Allergic Headaches. S. Fisher.—p. 36.
Diagnosis and Treatment of Otitis Media. L. W. Pratt.—p. 39.
Surgical Aspects of Peripheral Arterial Disease. J. F. Reynolds.—p. 43.
Acute Hydramnios Associated with Erythroblastosis Fetalis. C. E. Dore and I. I. Goodof.—p. 47.
Mushroom Poisoning. E. N. Ervin.—p. 48.
Hospital Admissions—Can Admitting Procedures be Improved? F. T. Hill.—p. 49.
Role of Laboratory in Staff Development. I. I. Goodof.—p. 51.

Military Surgeon, Washington, D. C.

110:1-86 (Jan.) 1952. **Partial Index**

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Lipo-Protein-Nucleic Acid Complex in Treatment of Radiation Injury (Preliminary Report). R. M. Thompson.—p. 51.

Minnesota Medicine, St. Paul

35:1-96 (Jan.) 1952

*Maternal Syndrome Associated with Isoimmunization and Fetal Death in Utero. I. H. Kaiser.—p. 25.
Fetal Salvage in Pregnant Diabetic Patients. T. Petrick.—p. 28.
Postpartum Hemorrhage. E. C. Sargent Jr.—p. 32.
*Investigation into Etiology of Nausea and Vomiting of Pregnancy. I. C. Bernstein.—p. 34.
Dermatoses of Lower Extremities. I. Fisher.—p. 39.
Kyphoscoliotic Heart Disease: Report of Five Cases. E. G. Kidd and J. F. Briggs.—p. 42.
Economic Value of High Quality Milk. M. W. Clark.—p. 45.

Maternal Syndrome with Isoimmunization and Fetal Death in Utero.—Sudden weight gain with manifest edema and subsequent death of the fetus in utero characterize a striking maternal syndrome associated with grave degrees of isoimmunization. This is contrary to the assumption that isoimmunization produces no recognizable symptoms and can only be demonstrated by laboratory determination of circulating anti-Rh antibodies. Three cases are reported in which the patient had specific complaints. The common clinical features were a history of previous infant mortality due to erythroblastosis fetalis, the presence of high anti-Rh antibody titers, the sudden appearance prior to term of edema with sharp weight gain, and fetal death in utero shortly thereafter. Two patients also had severe itching, and one had symptoms indistinguishable from those of severe acute toxemia of pregnancy. No explanation for this sudden maternal hydrops has been found; careful study of patients showing this syndrome is needed as an aid to clinical management of a serious complication of pregnancy.

Etiology of Nausea and Vomiting of Pregnancy.—Psychiatric study does not support the theory that women with nausea and vomiting of pregnancy are neurotic. Individual and collective comparisons of 10 patients with the symptom and a control

group of 10 patients without it revealed no essential difference in their attitudes towards pregnancy, delivery, marriage and family, children, and spouse. The similarity of reaction is explained by the common factor of pregnancy in both groups; the difference in symptoms may be explained by different vomiting thresholds or a different method of expressing feelings of rejection of pregnancy caused by complex physical changes and emotional stresses.

Missouri State Medical Assn. Journal, St. Louis

49:101-192 (Feb.) 1952

Observation on Use of Cortisone After Orthopedic Operations and Manipulations. L. T. Ford and J. A. Key.—p. 113.
Autonomic Studies in Diagnosis of Peripheral Nerve Lesions. F. P. Nach. —p. 116.
Treatment of Cardiac Complications of Hypertension. O. P. J. Falk. —p. 118.
ACTH and Cortisone in Rheumatoid Arthritis: Follow-Up Study of Clinical Effect in 34 Cases. F. Ficher and C. S. Gillmor.—p. 123.

Nebraska State Medical Journal, Lincoln

37:1-28 (Jan.) 1952

Medical Management of Lung Abscess. M. Beber and L. R. James.—p. 3.
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Clinical Application of Hyaluronidase. S. A. Swenson Jr.—p. 9.
Clinical Electroencephalography in Convulsive Disorders. R. J. Ellingson. —p. 12.

37:29-64 (Feb.) 1952

Use of ACTH and Cortisone in Treatment of Rheumatic Carditis in Children. T. N. Hall.—p. 31.
Recurrent Nonspecific Pericarditis with Case Report. W. H. Griffith. —p. 34.
Chapter in Cardiovascular Surgery. H. H. McCarthy.—p. 40.
Recent Observations on Prognosis and Treatment of Essential Hypertension. H. J. Lehnhoff Jr.—p. 44.
Dissecting Aneurysm of Aorta: Clinicopathologic Observations in 12 Cases. B. C. Russum and W. J. Reals.—p. 46.

New England Journal of Medicine, Boston

246:115-160 (Jan. 24) 1952

*Surgical Treatment of Peptic Ulcer. F. H. Lahey and S. F. Marshall. —p. 115.
*Reversible Toxic Manifestations in Patients with Cirrhosis of Liver Given Cation-Exchange Resins. G. J. Gabuzda Jr., G. B. Phillips and C. S. Davidson.—p. 124.
Audible Auricular Heart Sounds in Auricular Flutter. J. P. Rattigan, W. W. Byrnes, H. Kraus and H. S. Sise.—p. 130.
Effect of Combined Therapy (Dihydrostreptomycin and PAS) on Emergence of Streptomycin-Resistant Strains of Tubercle Baccilli. S. J. Shane, J. H. Laurie, C. Riley and M. Boutilier.—p. 132.
Hormonal Treatment of Cancer. I. T. Nathanson and R. M. Kelley. —p. 135.

Surgical Treatment of Peptic Ulcer.—In a series of 16,000 patients with peptic ulcer 1,811 were operated on from 1931 to 1950, and 1,603 of these were subjected to partial gastrectomy. From this large experience it has been concluded that the mortality from surgical treatment of duodenal ulcer is increased in patients with repeated attacks of ulcer activity over 5 to 15 years, because of the increased hazard of removal of a chronically indurated ulcer involving the common duct or deeply eroding the head of the pancreas. Earlier partial gastrectomy in patients with duodenal ulcer under medical management is urged to lower further the mortality rate in this operation. The decision for or against operation in bleeding peptic ulcers is difficult. Surgical measures to control bleeding should be instituted when the total blood volume drops below 60%. Early decision for or against surgery in patients with recurring pyloric obstruction was made possible by Wilkinson's drainage test, which consists of introducing 3 oz. (90 cc.) of noncurding milk mixture every hour through an indwelling gastric tube, clamping the tube for the first half hour and draining it for the second half hour throughout the 24 hours for three to four days, and determining the changes in the amount of residual matter. Pancreatitis, particularly in the head of the pancreas, is a possible serious complication of partial gastrectomy for duodenal ulcer. To prevent this complication, the accessory pancreatic duct should be carefully searched for whenever the duodenum is removed from the head of the pancreas in order to obtain an adequate length for safe inversion; if seen it must be securely ligated. Introduction of needles or sutures into the head of the pancreas should be avoided. Considering the relation of gastric ulcer to malignancy, the authors feel that nearly ever ulcer arising on the greater curvature of the stomach is malignant. If a gastric ulcer does not heal completely within six weeks on conservative treatment, it should be treated as soon as possible by gastric resection. All recurrent gastric ulcers should be resected promptly. Of 13 patients with ulcers high on the lesser curvature that required total gastrectomy and who were followed for two to eight years after the operation, 12 obtained excellent results. The only patient who died had a perforated ulcer that was treated by an emergency total gastrectomy. Concerning the place of vagotomy in the surgical management of duodenal and jejunal ulcer, the authors agree with Phemister that vagotomy is the logical approach to inhibit the cepahlic phase in the control of hyperacidity, when the possibility of this control by partial gastrectomy has already been exhausted by an adequate performance of the latter operation. Partial gastrectomy must be the first choice of any operative procedure for a patient with peptic ulcer.

Cation-Exchange Resins in Liver Cirrhosis.—Of 12 patients with severe cirrhosis of the liver treated for ascites and edema with cation-exchange resins, 4 were given ammonium resin, 4 hydrogen resin, and 4 ammonium potassium resin. During 18 courses of therapy with 30 to 90 gm. daily in divided doses for from 3 to 13 days, 10 of the patients had significant diuresis, with reduction in ascites and edema and loss of body weight. Neurological disturbances occurred on eight occasions in six of the eight patients receiving the ammonium resins. The disturbances first appeared on the third day of treatment and consisted of drowsiness, apathy, weakness, slurring of speech, disorientation, confusion, inappropriate behavior, and a coarse, irregular flapping tremor intensified by maintenance of posture. In two patients these changes occurred during the first course of resin, cleared promptly when resin was discontinued, and recurred on reinstitution of the resin. The tremor usually appeared first and persisted longer than the alterations in the mental state, and the changes were quickly reversed after resin was discontinued. Since the neurological complications were not concomitant with alterations in the serum sodium or potassium concentrations or with the degree of acidosis, they could not be definitely attributed to these alterations. In contrast, two patients given the hydrogen resin had typical clinical manifestations of hypokalemia and acidosis without the neurological abnormalities observed in the patients given the ammonium-containing resins. Constipation and fecal impaction occurred frequently as a complication of resin therapy. The similarity of the tremor and mental changes observed in the patients given ammonium-containing resins to the neurological manifestations of impending hepatic coma suggests a common biochemical basis. The untoward effects noted in the authors' patients indicate that the cation-exchange resins are poorly tolerated by patients with severe liver disease and should be administered cautiously if at all. These resins do not replace an adequate diet rigidly restricted in sodium content as the best method of management of ascites and edema in patients with liver disease.

New Jersey Medical Society Journal, Trenton

49:1-44 (Jan.) 1952

Some Critera for Social Maturity. C. N. Baganz.—p. 3.
Slipped Femoral Epiphysis. R. E. Humphreis.—p. 6.
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Insulin Subcoma Therapy in Treatment of Anxiety States: Study of 50 Cases in Private Office Practice. R. Van Amberg.—p. 12.
Resistant "Animal-Type" Ringworm Infection of Scalp Treated with X-Ray Therapy. M. Braitman.—p. 17.
Bedside Management of Common Cardiac Emergencies. A. Abraham. —p. 18.
Criteria for Replacement Transfusion. R. Pollack.—p. 21.
New Nitrogen Free, Hypo-Allergic Antipruritic. O. J. Sokoloff and F. M. Berger.—p. 23.
Trombo-Angiitis Obliterans in Women: Review and Report of Proved Case. N. Frank.—p. 26.
Rational Use of Cortisone in Rheumatic Diseases. I. L. Sperling.—p. 29.

Pennsylvania Medical Journal, Harrisburg

55:97-192 (Feb.) 1952

Surgery of Congenital Heart Disease. W. L. Riker.—p. 117.
Recent Advances in Treatment of Severe Hypertension. J. H. Hafkenschiel.—p. 120.
New Drugs in Medical Management of Uncomplicated Peptic Ulcer. M. A. Hershenson and L. M. Hershenson.—p. 125.
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Intravenous Injection of Procaine in Treatment of Pruritus Ani. L. G. Beinhauer and S. R. Perrin.—p. 133.
Surgical Aspects of Pregnancy. J. R. Willson.—p. 135.
Radioactive Isotopes in Surgery. C. Moses.—p. 140.
Early Diagnosis of Cancer. D. W. Clare.—p. 143.
Roentgenologic Diagnosis of Peptic Ulcer: With Special Reference to Percentage Incidence of Duodenal Ulcer in Routine Gastrointestinal Examinations. S. G. Henderson.—p. 147.

Quart. Bull. Sea View Hospital, Staten Island, N. Y.

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Studies on Activity of Hydrazine Derivatives of Isonicotinic Acid in Experimental Tuberculosis of Mice. E. Grunberg and R. J. Schnitzer. —p. 3.
Tuberculosis in Macacus Rhesus Treated with Isonicotinylhydrazine. I. Zieper and R. A. Lewis.—p. 12.
Toxicity of Hydrazine Derivatives of Isonicotinic Acid in Chemotherapy of Human Tuberculosis (Preliminary Report). I. J. Selikoff, E. H. Robitzer and G. G. Ornstein.—p. 17.
Chemotherapy of Human Tuberculosis with Hydrazine Derivatives of Isonicotinic Acid (Preliminary Report of Representative Cases). E. H. Robitzek, I. J. Selikoff and G. G. Ornstein.—p. 27.
Marsilid in Treatment of Tuberculous Orthopedic Lesions (Preliminary Report). D. M. Bosworth, H. A. Wright and J. W. Fielding.—p. 52.

Radiology, Syracuse, N. Y.

58:1-160 (Jan.) 1952

*Osseous Lesions of Tuberous Sclerosis. J. F. Holt and W. W. Dickerson. —p. 1.
Dental Roentgenologic Manifestations of Systemic Disease: I. Endocrine Disturbances. E. C. Stafne.—p. 9.
Betatron Cancer Therapy. R. A. Harvey, L. L. Haas and J. S. Laughlin. —p. 23.
Late Sequalae Following Cancericidal Irradiation in Children: Report of Three Cases. W. T. Murphy and D. L. Berrens.—p. 35.
Beam-Directed High-Dosage Radiotherapy of Bronchogenic Carcinoma. L. R. Felton.—p. 43.
Esophagus and Mediastinal Lymphadenopathy in Bronchial Carcinoma. F. G. Fleischner.—p. 48.
Accurate Method for Measurement of Radioiodine in Thyroid Gland by External Counter. T. Fields and G. V. LeRoy.—p. 57.
*Scintillation Counter as Instrument for in Vivo Determination of Thyroid Weight. H. C. Allen Jr. and W. E. Goodwin.—p. 68.
Innominate Artery: Angiocardiographic Study. E. I. Honig, I. Steinberg and C. T. Dotter.—p. 80.
New Method for Demonstrating Aberrant Right Subclavian Artery. R. L. Raphael, T. G. Schnabel Jr. and S. S. Leopold.—p. 89.
Thrombosis of Internal Cartid Artery. R. Shapiro.—p. 94.
Radiographic Diagnosis of Hydrocolpos in Infants. L. L. Klostermyer and J. J. Thompson.—p. 100.
Anterior Sacral Meningocele. R. J. Calihan.—p. 104.
Urinary Incontinence in Women: Roentgen Manifestations. A. K. Briney and P. J. Hodes.—p. 109.

Osseous Lesions of Tuberous Sclerosis.—Holt and Dickerman group Bourneville's tuberous sclerosis with Reckinghausen's neurofibromatosis and with Sturge-Weber cephalotrigeminal angiomatosis under the general classification "hereditary congenital ectodermoses." Tuberous sclerosis gets its name from the potato-like nodules in the brain, which are the basic pathological lesions. These nodules are smooth, white, relatively hard sclerotic patches, which may project into the lateral ventricles. The nodules may calcify, particularly those in and about the basal ganglia. Patients with tuberous sclerosis present the triad of facial adenoma sebaceum, mental deficiency, and convulsions. Retinal tumors (phakomas) are just as common as they are in the other congenital ectodermoses, and renal tumors of the mixed embryonal type occur in a large proportion of cases. Defective development and tumor or cyst formation in the lungs, heart, liver, adrenals, and other structures are also seen occasionally. Tuberous sclerosis is much less common than neurofibromatosis; during a period in which approximately 180 patients with neurofibromatosis were seen, only 10 accurate diagnoses of tuberous sclerosis were made. In addition to these 10 cases, the authors had available for study 33 patients from a hospital for epileptics. A roentgenologic survey of these 43 patients with tuberous sclerosis revealed skeletal abnormalities which, though less diversified than those in neurofibromatosis. are more diagnostic in their appearance. Seventeen of 40 patients had scattered sclerotic plaques in the cranial vault and 20 of the 30 patients who had roentgen examination of the hands and feet showed localized cyst-like areas of bone destruction in the phalanges and/or wavy periosteal new bone formation along the shafts of the metatarsals and metacarpals. These osseous lesions in the extremities are so strikingly similar to each other and to illustrations in the literature that they may be considered valuable aids in diagnosis of tuberous sclerosis.

Scintillation Counter for in Vivo Determination of Thyroid Weight.—A scintillation type of radiation detector consists of a luminescent phosphor capable of transforming an appreciable fraction of the incident particle of radiation energy into luminescent light, a photomultiplier tube for converting this light into electric pulses, and the necessary electronic equipment to record these pulses. Allen and Goodwin describe the two types of scintillation counters that have been used in their laboratory and clinic over the past eight months. Because of the greatly increased sensitivity of the "wide angle" scintillation counter over the conventional end window Geiger-Müller counter for detection of gamma radiation, it has become possible to lower the tracer dose of I^{131} required for routine diagnostic thyroid surveys from between 50 and 250 μc of eight-day radioiodine to 1 μc of I^{131}. The "wide angle" scintillation counter is more than 100 times as sensitive as the end window Geiger-Müller counter, while the "directional" scintillation counter is 35 times as sensitive. When the "directional" scintillation counter is used for total uptake studies, a larger dose than 1 μc of I^{131} is required as a tracer dose. As an outlining instrument, the "directional" scintillation counter makes it possible to determine the completeness of a total or the extent of a subtotal thyroidectomy. In several cases of thyroid carcinoma, it has been possible to demonstrate paratracheal areas of radioactivity following a total thyroidectomy. The most important use of the "directional" scintillation counter at the present time, however, is for outlining the thyroid gland in thyrotoxicosis, as a means of determining thyroid weight. The determination of thyroid weight is of paramount importance in the calculation of the dose of radioiodine to be used in the treatment of this disease. Because it is now possible to determine the weight of the thyroid with a reasonable degree of accuracy, the authors no longer give a standard dose of radioiodine to every patient with hyperthyroidism, to be followed later by a second dose should the initial dose be inadequate. Instead, each dose is individualized. They feel that a single dose accurately calculated will produce a better therapeutic response than repeated small doses.

Tennessee State Medical Assn. Journal, Nashville

45:1-46 (Jan.) 1952

Bladder Irritation in the Female. C. C. Stauffer.—p. 1.
Clinical Results with Cortisone in Ophthalmology. C. King, P. Lewis and W. McKinney.—p. 5.
Prognosis in Congestive Heart Failure. R. C. Sexton Jr.—p. 10.
Repository Tubocurarine in Trauma. W. W. Hoback.—p. 16.
Disseminated Histoplasmosis. K. R. Deibert.—p. 19.
Complications of Insulin Therapy. A. B. Scoville Jr.—p. 23.

Wisconsin Medical Journal, Madison

51:1-144 (Jan.) 1952

Disability Evaluation. C. C. Schneider.—p. 35.
Wills for Physicians. W. F. Waugh.—p. 37.

51:145-236 (Feb.) 1952

Ectopic Pregnancy: Report of Three Unusual Cases and Analysis of 83 Cases at Milwaukee Hospital. F. J. Hofmeister and C. A. Hultman. —p. 166.
Comparative Evaluation of New Oral Cholecystographic Agent (Telepaque) with Priodax: Preliminary Report. J. L. Marks and J. A. Schelble.—p. 171.
Highlights in Diagnosis and Treatment of Some Common Ear, Nose, and Throat Conditions. I. Muskat.—p. 173.
Medical Problems in Atomic Exposure. G. M. Lyon.—p. 176.

FOREIGN

Archives of Disease in Childhood, London

26:477-628 (Dec.) 1951. **Partial Index**

Observations on Vitality of the Newborn. F. E. Hytten.—p. 477.
Phenylketonuria with Study of Effect upon It of Glutamic Acid. L. I. Woolf. and D. G. Vulliamy.—p. 487.
Significance of Brushfield's Spots in Diagnosis of Mongolism in Infancy. H. R. E. Wallis.——p. 495.
Epilepsy in Mongolism. B. H. Kirman.—p. 501.
*Origin of Lung Cysts in Childhood. D. J. Conway.—p. 504.
Hypopituitarism in First Cousins. D. Hubble.—p. 530.
Obesity in Child. D. Macaulay.—p. 539.
Radiological "Double Contour" Effect in Long Bones of Newly Born Infants. N. M. Hancox, J. D. Hay, W. S. Holden and others.—p. 543.
Clinical Features, Diagnosis, and Osseous Lesions of Gargoylism Exemplified in Three Siblings. W. P. U. Jackson.—p. 549.
Volume and Acidity of Gastric Contents in Unfed Newborn Infant. J. Thomson.—p. 558.
Perforated Peptic Ulcer in Mongoloid Infant Associated with Congenital Diaphragmatic Hernia. R. Spencer and M. M. Rogerson.—p. 566.
Relationship of Cystic Lesions of Acini of Pancreas to Age, Cause of Death, and Fibrocystic Disease in Children. J. L. Emery.—p. 570.
Gangrene of Forearm in the Newborn. R. J. K. Brown and S. R. N. Smith.—p. 574.
Familial Incidence of Non-Lipoid Reticulo-Endotheliosis (Letterer-Siwe Disease). A. J. M. Reese and E. Levy.—p. 578.
Auricular Septal Defect in One of Monozygotic Twins. C. C. Forsyth and I. Uchida.—p. 582.
Inclusion Disease in Childhood. N. E. France.—p. 588.
Diagnosis of Virus Pneumonia in Infants and Children. D. Macaulay. —p. 601.
Congenital Hemiatrophy of Brain. L. Crome.—p. 608.

Origin of Lung Cysts in Childhood.—Occasionally, indisputable evidence that lung cysts are congenital is provided at necropsy on a stillborn fetus, but oftener the conclusion as to whether the disease is congenital or acquired is based on embryologic and histological data supported by conjecture. In this paper a group of cases are reported in which the development of lung cysts was studied by prolonged clinical observation and serial radiography. The author does not doubt that some cysts are congenital, but the evidence he presents supports the hypothesis that most pulmonary cysts are acquired, and that they are generally the product of mechanical and inflammatory forces. Evidence of inflammation is often seen at necropsy. There are bound to be gradations from cysts due to purely mechanical factors to necrotic cavities that are entirely the result of infection. The following classification of lung cysts has been used: (1) emphysematous and interstitial bullae, blebs, and pneumatoceles; (2) lung abscess, pulmonary infarction with necrosis, and bronchial distension; (3) tuberculous cavitation; (4) multiple honeycomb lung; and (5) traumatic cysts. Cases illustrating these different types are discussed.

British Journal of Industrial Medicine, London

9:1-92 (Jan.) 1952. **Partial Index**

Rheumatism in Miners: Part I. Rheumatic Complaints. J. W. Lawrence and J. Aitken-Swan.—p. 1.
Study of Conditions Under Which Methanol May Exert Toxic Hazard in Industry. G. Leaf and L. J. Zatman.—p. 19.
Determination of Small Amounts of Tetranitromethane in Air. V. B. Vouk and O. A. Weber.—p. 32.
Clinical-Pathological Report of Eight Cases of Methyl Bromide Poisoning. J. H. Prain and G. H. Smith.—p. 44.
*Vanadium Poisoning from Cleaning Oil-Fired Boilers. N. Williams. —p. 50.
Salt Losses of Men Working in Hot Environments. J. S. Weiner and R. E. van Heyningen.—p. 56.
Penetration of Dust Particles and Sites of Dust Stores in Pneumoconiosis. G. Mottura.—p. 65.
Skin Cancer of Hand and Forearm. C. N. D. Cruickshank and A. Gourevitch.—p. 74.

Vanadium Poisoning from Cleaning Oil-Fired Boilers.—The boilers in question were those of a generating station, consuming about 150 tons (136 M.T.) of fuel oil a week. Each boiler requires cleaning once a year. It takes a gang of eight men about five days to clean a boiler, after which the bricklayers enter to dismantle the firebrick walls and build new ones. The boiler cleaning methods in use when the investigation began produced large quantities of dust. The combustion chamber was cleaned by brushing the soot off the walls, and the boiler tubes by tapping with a rod. In the superheater chamber the banks of tubes had to be cleaned by a compressed air jet from a nozzle. Dismantling the firebrick walls also produced dust, and the bricklayers complained of symptoms similar, though less severe, to those experienced by the boiler cleaners. Williams points out that the vanadium content of crude oil ash varies from as high as 45% in the Venezuelian to none in the Pennsylvanian product. An oil with an ash content of 0.1% containing 40% of vanadium pentoxide would produce 1 lb. (0.45 kg.) of vanadium pentoxide for every 11 tons (about 10 M.T.) of oil burnt. All eight men had symptoms while cleaning the boilers. The first symptoms usually occurred between a half and one hour after the work was started, but in some cases were delayed for 12 hours. They consisted of rhinorrhea, sneezing, watering of the eyes, and soreness in the throat and behind the sternum. These symptoms can be described as the primary, and the secondary symptoms, which appeared after 6 to 24 hours, were dry cough, wheezing, severe dyspnea that necessitated rest after climbing a 20 foot ladder, lassitude, and depression, with a disinclination to follow the usual activities outside working hours. A greenish-black coating developed on the tongue, which faded two to three days after contact with petroleum soot was discontinued. Some of the men noted that the cough became paroxysmal and productive. These symptoms continued at work and only became less severe three days after the work was stopped. In one man the wheezing and dyspnea persisted for over a week, but none noticed any permanent ill effects. The urine of three of the men contained vanadium, and in two of these three the symptoms were especially severe. The author suggests that methods of cleaning oil-fired boilers should be reviewed, and that men working on these boilers should be medically supervised.

British Journal of Plastic Surgery, Edinburgh

4:231-306 (Jan.) 1952

Experience in Burying Live Scars. D. A. C. Reid.—p. 235.
Repair of Flexor Tendons in Hand. B. K. Rank and A. R. Wakefield. —p. 244.
Remarks of Aetiology of Congenital Bilateral Fistulae of Lower Lip. J. G. Warbrick, J. R. McIntyre and A. G. Ferguson.—p. 254.
Surgical Treatment of Post-Radiation Recurrent Basal-Cell Carcinoma of Face and Scalp. R. Champion and R. Gibb.—p. 263.
*Exposure of Skull from Burns. S. H. Harrison.—p. 279.
New Operation for Congenital and Paralytic Ptosis. M. Sarwar.—p. 293.
Parotid-Antral Fistula. M. H. Shaw.—p. 298.

Exposure of the Skull by Burns.—Eleven cases of scalp loss are reported, 10 of which were due to burns. The cases are divided into the following four groups: (1) whole skin loss of the scalp, with intact pericranium; (2) whole skin loss of the scalp, with pericranium involved; (3) whole skin loss involving the outer plate; and (4) whole skin loss, including both plates of the skull. Although the grades frequently overlapped, the depth of the burn determined the method of treatment. Five of the 11 patients had fallen into a fire during a fit. The case histories are presented, and it is pointed out that in group 1, in which the pericranium was intact, immediate free grafting proved successful. Failure to graft immediately with this type of lesion will lead to loss of the pericranium and exposure of bone, thus converting group 1 lesions into group 2 lesions. In group 2, where bone is exposed and the pericranium has been lost, decortication of the outer plate and immediate free grafting should be carried out. A similar procedure should be followed in group 3, where the outer plate has been involved. In group 4 removal of both plates of the skull and delay of grafting until granulations have formed over the dura would seem the only rational form of treatment. Transposed flaps, when practicable, can be used to cover the defect; but in doubtful group 2 cases estimation of the depth of the burn would be advisable if transposition is contemplated as a primary procedure. In cases where the bone has been involved, the use of transposed flaps should be deferred until sequestration is complete. Decortication is performed by cutting the outer plate into small squares with an electric saw and systematically removing the outer plate with a chisel and hammer until multiple bleeding points appear. Grafts are applied immediately or may be delayed. In cases in which operation has been delayed the skull invaded by granulation tissue becomes soft and friable, and the dura may be exposed or penetrated, particularly with lesions of the type in group 3 cases; the bone in the region of the suture lines is thin, and decortication should

be superficial in these areas. The middle meningeal artery, or more commonly one of its branches, may be divided and require ligation. The grafts will not take over dura, and 14 days must elapse before granulations are adequate to take a free graft.

Canadian Journal of Medical Sciences, Ottawa

30:1-112 (Feb.) 1952. **Partial Index**

Determination of Urinary Acid Phosphatases. G. E. Delory and M. Hetherington.—p. 1.
Acid Phosphatases of Human Urine. G. E. Delory and M. Hetherington. —p. 4.
Effect of Age, Sex, and Previous Pregnancy on Oxygen Uptake of Rat Mammary Tissue. J. Tuba and M. S. Fraser.—p. 14.
Relationship of Dietary Factors to Rat Serum Alkaline Phosphatase: II. Effect of Total Food Consumption, Methionine, Choline, and Vitamin B_{12} in Normal and Alloxan Diabetic Adult Rats. J. Tuba and N. B. Madsen.—p. 18.
Effect of Propylthiouracil on Weight and Concentrations of Cholesterol and Ascorbic Acid of Adrenal Gland. W. F. Perry.—p. 36.
*Radon in Normal Breath. E. J. Martin and J. K. W. Ferguson.—p. 42.
Studies on Passive Immunity in Poliomyelitis: III. Production of Immune Serum to Lansing Poliomyelitis Virus in Rhesus Monkeys. A. J. Rhodes, E. M. Clark and F. T. Shimada.—p. 54.

Radon in Normal Breath.—Under normal conditions the human body contains a certain amount of the radioactive gas, radon, which has been absorbed from the surrounding air and other sources, or has been generated from the radium in the body. Its distribution between aqueous liquids and gases is such that at equilibrium the concentration in the gaseous phase is greater. Consequently expired air is more suitable for analytical studies than blood or urine. The measurement of radon in the breath has been used extensively to estimate the amount of radium in the bodies of workers in the radium industries. Such measurements have in recent years been made by counting the alpha particles emitted per unit time by the radon and its decay products. To measure the very low radon content of the breath of individuals who have not accumulated abnormal amounts of radium in their bodies, the alpha counting equipment must be very sensitive and stable. Apparatus that satisfies these requirements has been built, and has made the present investigation possible. The radon content of the breath is close to and governed by the radon content of the atmospheric air and fluctuates with it. When the radium content of the body is increased, it contributes to the breath an increased amount of radon, which may still be within the range of the ordinary radon content of the air and therefore be veiled. By having the subjects breathe radon-free rather than atmospheric air, it is possible to investigate the content of radium in the body. It was found that when radon-free air is inhaled, the radon concentration in the expired air of normal subjects is considerably less than the concentration commonly found in "fresh" atmospheric air. The various sources of radon are discussed, and the authors state that under the conditions prevailing during their studies it appears that the radon in atmospheric air establishes a concentration of radon in the body that supplies a larger proportion of the exhaled radon than radon from all other sources put together. However, great fluctuation of the proportions may be expected, depending on local and atmospheric conditions.

East African Medical Journal, Nairobi

28:449-482 (Nov.) 1951

Two Cases of Onyalai in Uganda. H. C. Trowell.—p. 449.
*Treatment of Tropical Ulcers. H. D. O'Brien.—p. 453.
Acute Laryngo-Tracheitis. J. W. Nelson.—p. 462.

Treatment of Tropical Ulcers.—Tropical (phagedenic) ulcers cause considerable disability among workers in tropical countries. Reports from two hospitals in Tanganyika showed 2,125 new visits by ulcer patients in the outpatient department, while in the same period 258 ulcer patients were detained in hospital for an average of 27 days each. The average disability following discharge was about seven days, so that the total loss of working days and cost of hospital care is high. Patients with tropical ulcers may have loss of superficial tendons, involvement of tendons and joints in scar contractures, osteomyelitis, hyperostoses, chronic ulcers, unstable scars, and even malignant degeneration of the ulcer. Furthermore, the presence of a chronic discharging ulcer leads to secondary anemia and hypoproteinemia that leave the patient subject to intercurrent infections. Following brief remarks about the etiology and pathological aspects of tropical ulcers, the author discusses his experiences in the treatment in 368 cases of tropical ulcer. He gives particular attention to 314 patients in whom skin grafting was done, and concludes that treatment by infrequent occlusive dressings and parenteral penicillin injections, combined with skin grafting, produces the best results.

Giornale Italiano di Chirurgia, Naples

7:649-728 (Oct.-Nov.) 1951. **Partial Index**

Venous Pressure in Varices of Lower Extremities. G. D'Errico and C. Sabbatini.—p. 649.
Complete Volvulus of Small Intestine: Two Surgical Cases. F. Lippo. —p. 655.
Thrombosis of Varices Treated with Sclerosing Method. M. Masturzo. —p. 665.
*Anesthetic Block and Resection of Right Splanchnic Nerve in Treatment of Postcholecystectomy Syndrome. G. De Luca.—p. 683.

Treatment of Postcholecystectomy Syndrome.—Repeated anesthetic infiltration and resection of the right splanchnic nerve are indicated for treatment of the postcholecystectomy syndrome. Anesthetic blocking of this nerve was performed by the author in 20 patients who had undergone cholecystectomy. Eight patients recovered, of whom four are still well after two years and two after more than one year. In one patient in whom severe pain recurred after four months of improvement, additional blocking failed, whereas a second course of infiltrations was beneficial in a patient in whom improvement had lasted three months only. The condition of six patients was not changed. Lumbar extraperitoneal resection of the right splanchnic nerve was performed in six patients in whom infiltration had had some effect. Four patients have no symptoms 25, 22, 17, and 12 months, respectively, after the operation. In two patients symptoms recurred a few days and two months, respectively, after the operation.

Journal of Mental Science, London

98:1-228 (Jan.) 1952. **Partial Index**

"Whither Psychiatry?" P. K. McCowan.—p. 1.
Post-Operative Syndromes in Selective Prefrontal Surgery. J. L. Beau. —p. 12.
Reflections on 100 Capital Cases Submitted to Electroencephalography. D. Hill and D. A. Pond.—p. 23.
Immediate Effects of Leucotomy on Cerebral Functions and Their Significance: Preliminary Report. R. Klein.—p. 60.
Problems in Diagnosis and Classification of Mental Disorder in Old Age: With Study of Case Material. M. Roth and J. D. Morrissey.—p. 66.
Pellagra and Nutritional Neuropathies: Neuropathological Review. D. Leigh.—p. 130.
Spectroscopic and Photo-Electric Oximetry in Schizophrenia and Other Psychiatric States. J. W. L. Doust.—p. 143.
*Sympathetic Blockade in Treatment of Anxiety States. S. Smith.—p. 161.
Effects of Ethyl Alcohol and Acetaldehyde on Maze Behaviour and Motor Co-Ordination in Rats. R. K. Carpenter and L. D. MacLeod. —p. 167.

Sympathetic Block in Anxiety States.—Seventeen patients, 12 women and 5 men, had a combination of psychological indications of anxiety and tension and somatic manifestations, such as sweating, tremor, and palpitations. All these patients had received psychotherapy before treatment with hexamethonium. Their response to hexamethonium was determined by the effect of the drug on the sympatheticotonic symptoms and signs. Four of the group were treated in the hospital and the remainder as outpatients. Each patient took one tablet (0.25 gm.) after meals twice a day for five days, then three times a day for another five days, and so on up to four or five tablets every day. It was found that the best objective results were usually obtained between the 6th and 10th weeks of such treatment. A history of a cerebral or coronary vascular incident was a contraindication to treatment. The blood pressure—the usual clinical reason for use of hexamethonium—was lowered in 11 cases. Varying degrees of improvement were seen in all patients. In some, excellent results were obtained by removing physiological disturbances, which in turn were causing the patient much anxiety. Following hexamethonium therapy most patients were far more accessible to ordinary psychotherapeutic measures than before. Toxic effects were few and relatively unimportant. It is concluded that in patients with signs of sympathetic overactivity, hexamethonium is a useful adjuvant to psychotherapy.

Lancet, London

1:271-324 (Feb. 9) 1952

Pain in Breast. H. J. B. Atkins.—p. 271.
Pain in Carcinoma of Breast. D. C. Corry.—p. 274.
*Radiography of Human Body with Radioactive Isotopes. W. V. Mayneord.—p. 276.
Psychosomatic Symptom Formation. I. Macalpine.—p. 278.
Acute Dilatation of Stomach as Late Complication of Poliomyelitis. K. K. Hussain.—p. 282.
Micro-Method for Determination of Urinary α-Ketosteroids and β-Ketosteroids by Digitonin Fractionation and Colorimetric Estimation. R. M. Haslam and W. Klyne.—p. 285.
Prevention of Infection of Thoracic Surgical Wounds by Staphylococci from the Patient's Skin, with Note on Infection of Gloves. G. K. Harrison and D. B. Cruickshank.—p. 288.
Islet-Cell Tumour of Pancreas: Report of Case. A. N. Smith and J. B. Cochran.—p. 289.

Radiography with Radioactive Isotopes.—Mayneord says that he suggested in 1950 that it might be possible to use a strong radioactive source as a radiographic focus inside the body, and thus obtain unconventional views of structures often confused by superimposition with the ordinary radiographic techniques. After explaining why many of the radioactive isotopes are unsuitable for this purpose, he shows that thulium 170 has several advantages. Thulium 170 emits gamma rays and two groups of beta rays, but much more information is required before it can be said accurately what radiation is emitted. However, there can be no doubt that the bulk of the radiation is made up of 0.084 mev of gamma rays accompanied by the x-ray characteristic of ytterbium. Thulium 170 is obtained by placing thulium, a rare earth of the lanthanide series, in the pile and irradiating with slow neutrons. Normal thulium (stated to consist entirely of thulium 169) captures a neutron to form thulium 170. By irradiating for a year or more, it may be possible to manufacture isotopes whose activities are at least 5 curies per gm. The prolonged irradiation needed to reach this activity is related to the relatively long half-life of thulium, namely, 127 days. For preliminary experiments chips of thulium oxide, weighing only a few milligrams, were used in the bottom of a small glass tube into which they were sealed by an ebonite rod that fitted the tube. This rod has a small depression in its end, thus effectively making a point source at the bottom of the tube. To cut out the intense beta radiation, a block of "perspex" was turned so as to form a sphere enclosing the point source, the radius of the sphere being 5 mm., just sufficient to stop the beta rays. The first experiments were carried out with a dried skull. Dental and skull radiography are perhaps the first obvious applications of the new method. Preliminary calculations show that techniques using radioactive isotopes are unlikely to compete seriously with the classic radiographic techniques, but the advantages of a small source of x-radiation, free from electric mains and complex equipment, are apparent. Satisfactory photographs have been taken with thulium 170, but long exposures are necessary at present.

Medicina Clínica, Barcelona

17:349-418 (Dec.) 1951. **Partial Index**

*Epidemic Myalgia, Myalgic Meningitis and Coxsackie Virus. A. Pedro-Pons and P. Farreras Valentí.—p. 374.
Personal Experience with Cortisone, Corticotropin (ACTH) and Pregnenolone in Gout and Rheumatoid Arthritis. J. M. Poal.—p. 383.
Late Results of Cholecystectomy. N. Lloret-Barber.—p. 387.
Operative Cholangiography. J. Soler-Roig.—p. 388.
Meningitis Due to Hemophilus Influenzae. J. M. Sala Ginabreda.—p. 392.
Traumatic Accidents of Electroshock and Curarization. J. M. Pedrosa Roca.—p. 395.
"Surgical" or Auxiliary Skin Grafts. L. Mir y Mir.—p. 403.

Epidemic Myalgia.—Epidemic myalgia is a summer febrile infection that is common in children and young adults and rare in persons over 30 years of age. It is due to the Coxsackie virus and transmitted by direct contact with the patient. After an average incubation of two days, the disease starts suddenly with fever, symptoms of influenza, gastrointestinal disorders, and violent pain of the thoracoabdominal and diaphragmatic muscles. Pain of a neuralgic type is the predominant symptom. The pain increases on palpation of the involved muscles. The symptoms are similar to those of an acute condition of the abdomen, pleurisy, or renal colic. The disease may run a simple course or have one or two remissions and relapses. In the majority of cases the disease lasts one or two weeks, which includes the initial attack, a remission of 3 or 5 days, and a relapse. Myalgic meningitis alone or associated with or followed by orchitis and nephritis often constitute the second or third relapse. Reappearance of the acute symptoms, with ocular pain, acute headache, and moderate rigidity of the back of the neck, mark the meningeal form of the disease. The changes in the cerebrospinal fluid (lymphocytosis and positive Pandy and Nonne tests) are different from those of tuberculous meningitis and other forms of virus lymphocytic meningitis. The meningeal symptoms last from 10 to 20 days, after which they regress and disappear without sequelae. The form of the disease (myalgic, meningeal, and nervous) depends on the strain of the causative virus, which can be myotropic, meningotropic, neurotropic, or pleotropic. The neurotropic strain is rare. The pleotropic strain causes either the myalgic or the meningeal forms. The prognosis of the disease is good. The treatment is symptomatic. Intramuscular injections of opiates are indicated to control acute crises of pain. Antibiotics are of no avail. Red "prontosil" (an azosulfamide) in daily doses of 3 gm. for 7 to 12 consecutive days controls the disease. The infection is rare in Spain. The four cases reported by the author bring to seven the total number of cases observed in that country. The disease was uncomplicated in two cases, but was followed by myalgic meningitis in one case and by orchitis and petechial purpura in another case.

Practitioner, London

168-1-108 (Jan.) 1952. **Partial Index**

Acute Bronchitis and Pneumonia in Childhood. R. H. Dobbs.—p. 6.
Heart Disease in Childhood. D. Hubble.—p. 17.
Endocrine Disorders in Childhood. W. Gaisford.—p. 25.
Allergy in Childhood. A. G. Watkins.—p. 33.
Acute Abdomen in Childhood. C. Donald.—p. 41.
Blood Disorders in Childhood. D. Gairdner.—p. 49.
Experiences with Newer Drugs in Parkinsonism. R. B. Raffle.—p. 62.
*Unusual Complication of Sea-Sickness. S. W. Maxwell.—p. 71.
Osteopathy: Its History, Theory and Practice. I. Geikie-Cobb.—p. 72.

Unusual Complication of Sea-Sickness.—A girl, aged 21, had been on a sea trip lasting four hours. She was very seasick. About half an hour before the end of the trip she had a particularly violent bout of vomiting, during which she felt pain in both ears and became partially deaf. She could hear faintly what other people were saying, and her own voice sounded distant and smothered. The earache persisted all night but wore off in the morning. On examination of the right ear there was an oval-shaped perforation of the tympanic membrane. The left tympanic membrane showed a pouch of mucous membrane hanging down from a perforation. Five days later both perforations were healed.

Proceedings of Royal Society of Medicine, London

45:1-50 (Jan.) 1952. **Partial Index**

Treatment of Menorrhagia: President's Address. G. I. Strachan.—p. 7.
A Surgeon and Medical Education: President's Address. D. H. Patey.—p. 25.
Uretero-Intestinal Anastomosis: Observations on Technique and End-Results with Review of 138 Personal Cases: President's Address. A. Jacobs.—p. 33.
Some Observations on Treatment of Carcinoma of Rectum: President's Address. C. Butler.—p. 41.

Riforma Medica, Naples

66:1-28 (Jan. 5) 1952

*Surgical Treatment of Angina Pectoris. G. Pieri.—p. 1.
Aureomycin Therapy of Enterocolitis. V. Scaffidi and S. Scaletta.—p. 6.
Ratio Between Urea Clearance and Diuresis. G. Gigli, G. Muiesan and R. Rossi.—p. 12.

Surgical Treatment of Angina Pectoris.—Danielopolu's operation was performed in six patients with angina pectoris, three of whom had a mitral lesion, two mild dilatation of the arch of the aorta and mild hypertension, and one moderate hypertension. The cervical part of the sympathetic chain above the stellate ganglion, the cardiac rami of the cervical sympathetic and the cervical vagus nerve, and the rami communicantes originating from the lateral margin of the stellate ganglion were excised on the left side. Results were good in three patients. A marked im-

provement lasted three and one-half years in one patient, one is still well after nine years, and one was well for 14 months but was not followed thereafter. In two patients the treatment failed, and pain appeared in the right side of the chest. A second operation performed in these patients on this side after one year and two months, respectively, failed. The first patient died, and autopsy revealed thrombosis of the superior vena cava, subclavian vein, and right jugular vein. Severe pain reappeared in one patient five years after the first operation. The preaortic plexus was resected, and a marked improvement is present after one year. The same operation was performed in another patient in whom repeated blocks of the preaortic plexus with anesthetics were palliative only temporarily. He was able to resume his job, and is still well after 22 months. In another patient with angina pectoris resection of the left stellate ganglion failed. Thus resection of the preaortic plexus appears to be the treatment of choice.

South African Medical Journal, Cape Town

25:921-940 (Dec. 15) 1951. **Partial Index**

*Typhoid Fever in South Africa: Treatment of 215 Cases Without and 139 with Chloromycetin (Chloramphenicol). H. le Riche and P. N. B. Peacock.—p. 921.
Macular Changes in Rift Valley Fever. L. Schrire.—p. 926.
Rift Valley Fever in Man Complicated by Retinal Changes and Loss of Vision. I. Freed.—p. 930.

Treatment of Typhoid With and Without Chloramphenicol.—As the result of a decision of the Health Department of the Union of South Africa to pay in part for the chloramphenicol used in the treatment of typhoid, the hospitals concerned were requested to submit data on the patients treated. This paper is based on 139 cases of typhoid treated with chloramphenicol in the Union of South Africa. Observations on these cases are compared with those on 215 who were treated for typhoid in 1948-1949, before chloramphenicol became available. While the mortality rate was lower in the group treated with chloramphenicol than in the controls, the difference was not statistically significant. The group treated with chloramphenicol spent an average of 28.8 days in the hospital, while the control group was hospitalized for an average of 36.5 days. This difference is regarded as statistically significant. The average dose of chloramphenicol was 14.6 gm. The average number of days of fever for the chloramphenicol group was 6.3, against 22 for the control group. There were more relapses in the group treated with chloramphenicol than in the control group, but there was a statistically significant lowering of the rate of complications in the chloramphenicol group. There is no evidence that chloramphenicol either decreases the carrier rate, or cures chronic carriers.

Tidsskrift for Den Norske Laegerforening, Oslo

71:787-830 (Dec. 15) 1951. **Partial Index**

*Hemolytic Syndrome. K. Aas.—p. 787.
Problems in Geriatrics. P. Hanssen.—p. 798.
Surgical Treatment of Acute Stenosis of Larynx. S. Quist-Hanssen.—p. 801.
Treatment of Varices. B. Fretheim.—p. 803.
Care of Alcoholic Addicts. A. Kanter.—p. 808.

Hemolytic Syndrome.—Three cardinal symptoms—anemia, jaundice, and enlarged spleen—are usually present in the more marked forms of the hemolytic syndrome. The course in hemolytic diseases is often chronic, occasionally interrupted by acute aggravations. In some cases the disorder is acute, with a fulminant course and fatal outcome within a few days. In many cases the course is so mild that there are periods without anemia or jaundice. In the first of the three main groups of hemolytic diseases a defect in the erythrocyte itself is the most important cause. The group includes familial hemolytic jaundice, also called congenital hemolytic anemia or hereditary spherocytosis. The spherocytes persist after splenectomy, but the operation is effective, as the most important site of stagnation for the red blood corpuscles is removed. While congenital hemolytic anemia generally has a benign chronic course, crises endangering life may occur, with rapidly falling blood values. In this group are also sickle cell anemia, Cooley's anemia, paroxysmal nocturnal hemoglobinuria, and some other hereditary hemolytic disorders. The second main group consists of acquired hemolytic anemias due to exogenous factors, toxins of various kinds, or the occurrence of pathologic agglutinins or hemolysins. Included here are the acute hemolytic syndromes that appear in transfusion of incompatible blood and the hemolytic syndrome in the newborn. A sensitizing substance can be established by Coombs' test. There is usually a shifting chronic course, sometimes with crises threatening life. Splenectomy may result in recovery or improvement. The third important group is made up of hemolytic anemias with a course resembling that in the immunologic type, but with negative Coombs' reaction. Examination of 22 patients with anemia connected with different basic diseases revealed a hemolytic mechanism in 16. There is believed to be a primary splenogenic destruction of normal red blood corpuscles. Splenectomy may have a good effect. It has already been performed in 5 of the 16 patients, with complete recovery in 2 and improvement in 2; one patient died of acute heart failure. Splenectomy is contraindicated in cases with myelofibrosis. All patients with hemolytic syndromes will at times require blood transfusion. Blood typing often presents difficulties because of autoagglutination. Transfusion of blood corpuscles alone and not plasma has been found to be advantageous and is the method now mainly used in the Rikshospital. In all three main forms of the hemolytic syndrome splenectomy is the most important treatment. Recurrence after splenectomy may be due to an accessory spleen, which must eventually also be removed. Since treatment with bishydroxycoumarin (dicumarol®) from the day after operation was started at the Rikshospital, there has been no case of thrombosis or embolism after splenectomy. Roentgen treatment of an enlarged spleen may at times be effective. Treatment with iron, liver extracts, vitamin B_{12}, and folic acid is usually ineffective. Corticotropin (ACTH) and cortisone can have an excellent effect in certain cases, especially pre and postoperatively.

Ugeskrift for Laeger, Copenhagen

113:1687-1726 (Dec. 13) 1951. **Partial Index**

*Twenty-Four Cases of Myelomatosis. B. F. Andersen.—p. 1687.
Myelophthisic Anemia as Terminal Phase in Polycythemia Vera. Long-Continued Roentgen Treatment Followed by Myelosclerotic Syndrome. E. Roelsen and A. S. Ohlsen.—p. 1691.
Paroxysmal Nocturnal Hemoglobinuria and Observations on Specific Test. H. Letman.—p. 1698.
Simple Spontaneous Pneumothorax Treated with Talcum Powdering. P. B. Petersen.—p. 1699.
Anemia Gravis Myeloblastica Infantum: A Case in a 10-Month-Old Girl Twin. O. Birn, O. Perbøll and A. S. Ohlsen.—p. 1706.
Case of Bishydroxycoumarin ("Synparin") Intoxication Treated with Vitamin K and Blood Transfusion. Ø. Petersen.—p. 1709.

Twenty-Four Cases of Myelomatosis.—In 24 cases of myelomatosis treated from 1938 to 1951, there were 17 men and 7 women, aged from 38 to 70. The average duration of life after admission was eight months, and was the same for men and women. The temperature was usually normal, but in 13 cases it was occasionally subnormal. In 20 cases there was pain at the start, in three pain began after a couple of months, and in one case there was no pain. Normochromic anemia was almost always present. The erythrocyte sedimentation rate in myelomatosis may vary greatly in a short time. It is not related to the duration of life and cannot be used in prognosis. There seems to be a relation between albuminuria and sedimentation rates in that Andersen always found Bence-Jones protein and albumin in the urine of patients with low sedimentation rates. Hyperproteinemia was frequent. The roentgenologic changes, seen in 21 of 23 patients examined, in two cases consisted of halisteresis of the spine and in 19 varied from single to numerous roundish clear areas. Extensive roentgenologic changes appeared mainly in the patients with longer duration of life. The renal function was greatly reduced in 9 of 13 patients examined. In five cases no specific therapy was applied, as the patients were moribund on admission; in 15 roentgen treatment was given, and in four, combined roentgen and "stilbamidine" (4,4′ stilbenedicarboxamidine) treatment was given. There was good effect on the pain in six of the cases in which roentgen treatment was given, lessening of the pain in two cases after combined roentgen and "stilbamidine" treatment, and no effect in two. Diagnosis is particularly difficult in patients with lower sedimentation rates, but examination of the urine for Bence-Jones reaction is helpful.

BOOK REVIEWS

The Auricular Arrhythmias. By Myron Prinzmetal, M.D., and others. Cloth. $16.50. Pp. 387, with 323 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, 1952.

This well-written monograph records the extensive investigations on the nature of auricular arrhythmias of a well-coordinated research team whose work began in 1947. How much toil and effort must have been required is indicated in the dedication of the book: "To our neglected families without whose devotion this work would have been impossible."

For well over 30 years, English and American clinicians, teachers, and research workers have generally accepted Sir Thomas Lewis' interpretation of auricular flutter and fibrillation as being caused by circus movement. The Viennese school, however, never accepted the circus movement hypothesis. With newer, improved techniques, which include the use of a high-speed cinematograph, a dual beam cathode ray oscillograph, and a multichannel electrocardiograph, these investigators set out to reinvestigate the nature of auricular arrhythmias in the experimental animal and man. The data they derived, presented in detail in this book, led them to conclude that all auricular rhythms, other than a sinus rhythm, are caused by the discharge of an ectopic focus, the rate of discharge determining the rhythm. Thus, in the experimental animal with a rate below 300 per minute, auricular paroxysmal tachycardia is recorded on the electrocardiogram; with a rate between 300 to 400 per minute, there is auricular flutter; and with a rate exceeding 400 per minute, there is auricular fibrillation.

Although the evidence presented for the unitary nature of auricular arrhythmias is convincing, the authors rightly point out that further research is required, because many questions are still unanswered. Recent experimental work by other investigators lends support to the circus movement theory of auricular flutter and even suggests that two types of flutter may at times coexist in an auricle, one caused by rapid excitation of an ectopic focus and the other caused by circus movement. This monograph will certainly stimulate research in a field that has been dormant for many years.

The book is well illustrated; however, as the authors point out, the still photographs cannot convey the information with the same clarity as the slow motion moving picture films. Teachers, clinicians, and research workers in the field of cardiology should add this excellent book to their libraries.

Clinical Practice in Infectious Diseases for Students, Practitioners and Medical Officers. By E. H. R. Harries, M.D., F.R.C.P., Medical Superintendent, City Hospitals for Infectious Diseases, and University Clinical Lecturer on Fevers, Birmingham, and M. Mitman, M.D., F.R.C.P., Consultant Physician and Medical Superintendent, River Hospitals, Joyce Green, Dartford. With collaboration of Ian Taylor, M.D., M.R.C.P., Senior Medical Officer (Infectious Diseases), Public Health Department, London County Council, London. Fourth edition. Cloth. $6.50. Pp. 717, with 48 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1951.

This English textbook has now gone into its fourth edition in 11 years. It grew out of a series of clinical lectures to medical students who were expected to serve as public health officers later in their careers. Since the course in infectious diseases often serves as an introduction to clinical medicine, the approach, particularly in the early chapters, is a simple but basic one. The general principles of infection and resistance, the modes of transmission of infectious disease, and the development of immunity and hypersensitivity are covered in the early chapters. The general clinical response of the patient is then discussed with emphasis on the natural history of infectious disease. A chapter on differential diagnosis of eruptions and rashes is followed by a short chapter on laboratory aids and diagnosis.

Specific infectious diseases are then taken up in separate chapters. The specific diseases are discussed from the standpoint of epidemiology, the etiological agent, pathological findings, clinical features, complications, diagnostic aids, and differential diagnosis followed by treatment. In some of the diseases the course, complications, and prognosis are covered separately. The chapter on diphtheria is especially noteworthy. The section on serum disease seems unnecessarily long in view of the decreasing use of serum. The section on rickettsial disease discusses endemic and epidemic typhus, Q fever, and rickettsial pox, but omits Rocky Mountain spotted fever, one of the most important and severe rickettsial infections.

Good use is made of charts, tables, and color diagrams illustrating the principles of disease discussed in the text. The use of italicized words throughout the text to emphasize and contrast various features is helpful in quickly locating facts. The sections on general measures such as rest, diet, and nursing care are excellent. The general principles of chemotherapy are covered chiefly in the section on sulfonamide drugs, while the antibiotics have received less attention. The bibliography is not extensive, but the references have been well selected and have been brought up to 1949. The book should be a good one for medical students and house officers.

Essentials of Neurosurgery. By Leslie C. Oliver, F.R.C.S., Neurosurgeon, West End Hospital for Nervous Diseases, London. Cloth. 25s. Pp. 198, with 50 illustrations. H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C.1, 1952.

This is an elementary and rather superficial presentation of the subject of neurological surgery. It discusses operative technique, anesthesia, and the symptomatology and treatment of the various conditions confronting the neurosurgeon. The book presents nothing new except the brief concluding discussion on the surgical treatment of Parkinsonism. The author states that section of the lateral corticospinal or pyramidal tract in the cervical spinal cord has failed to give permanent relief from the tremor. This is in accord with the observations of Olivecrona, Le Beau, and others. Oliver now advocates an almost complete hemisection of the spinal cord for this purpose.

This book is similar to, but less complete than, the one by Loyal Davis published in this country. More detailed information is to be found in the books by Percival Bailey and by Ernest Sachs on intracranial tumors, the section by Walter Dandy in Lewis' "Practice of Surgery," and the volume on the technique of neurological surgery by Bancroft and Pilcher.

For the most part American neurosurgeons would not disagree with what Oliver has to say. But a few statements must be questioned. There is no evidence that the ventricles are capable of contracting (page 14), that increased intracranial pressure is frequently associated with exophthalmos (page 46), that tumors of the cerebellar vermis cause dysarthria (page 71), that epilepsy is a common complication of closed head injuries (page 127), that peptic ulcers arise as a result of closed head injuries (page 127), or that vitallium is not well tolerated by the tissues (page 135). One is glad to learn, after years of reading of the frequency of tuberculoma of the brain in England, that this is no longer the case (pages 16 and 78). One could hardly agree that "diodone," which is known as diodrast® in the United States, is not irritating to the tissues (page 18). Most American neurosurgeons would not agree that the scalp should be prepared the night before the operation (page 26) or that a wound should be drained if the possibility of a postoperative hemorrhage is feared (page 32). A medulloblastoma is not the type of tumor one would be most likely to find in the cerebellum of a 19-year-old girl (page 16), and astrocytomas are found in the cerebellums of children far more often than in adults (page 74). Von Hippel's disease (page 74) is angiomatosis retinae; Lindau described the association of Von Hippel's disease and hemangioblastoma of the cerebellum. The statement that the pain of tic douloureux is accompanied by contraction of the facial musculature is mis-

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

leading. Tic-like or spasmodic contractions of the face do not occur; the only facial movement is the grimacing induced by the pain. Surprisingly, glossopharyngeal neuralgia is not mentioned. Few American neurosurgeons would agree that the management of head injuries is incomplete without the utilization of electroencephalography. The symptomatology of tumors of the foramen magnum is most inadequately presented.

The book is attractively printed, and the illustrations are well reproduced.

Rehabilitation Nursing. By Alice B. Morrissey, B.S., R.N. Instructor in Rehabilitation Nursing, New York University-Bellevue Medical Center, New York. Foreword by Howard A. Rusk, M.D., Professor and Chairman of Department of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center. Cloth. $5. Pp. 299, with 58 illustrations. G. P. Putnam's Sons, 210 Madison Ave., New York, 1951.

This book is addressed to nurses in the hope that they will accept the challenge that rehabilitation offers to the nursing profession. The author has served in various teaching, supervisory, and administrative positions in the nursing field and is now a supervisor and instructor at the rehabilitation center at Bellevue Hospital. This book was written to provide some means for accomplishing the ultimate aim of rehabilitation, that is, the restoration of the handicapped person to the fullest physical, mental, social, vocational, and economic usefulness of which he is capable. The author feels that the means to accomplish this end are to acquire knowledge of the content of nursing care in rehabilitation, to develop an ability to teach the principles of rehabilitation nursing, to extend the practice of rehabilitation nursing into every area of nursing care, and to educate the public to accept the concept of rehabilitation.

The book is divided into three major parts. The first part, on the meaning of rehabilitation, takes up the history and philosophy of rehabilitation, statistics on the incidence and disability in the United States, and the nurse's role in rehabilitation. In the second part, on nursing principles and procedures in rehabilitation, nursing measures for the prevention and care of physical deformities and decubitus ulcers, procedures for bladder and bowel rehabilitation, techniques of crutch walking, care and use of mechanical leg braces, speech rehabilitation, and other subjects are discussed. The third part is devoted to the care of the amputee, the hemiplegic, the paraplegic, and the quadriplegic patient. Each chapter is followed by a bibliography. The material is presented essentially in narrative form with numerous case histories.

This book is recommended as a reference source for all nurses, —graduates and students alike. It gives a sound intellectual basis for the concept that rehabilitation is an integral part of all medical and nursing care.

The Physician as Man of Letters, Science and Action. By Thomas Kirkpatrick Monro, M.A., M.D., LL.D. Second edition. Cloth. $4.50. Pp. 259. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1951.

The second edition of this book consists of an expanded compilation of pithy biographical sketches of physicians who distinguished themselves in ways other than in the practice of medicine. Although most of the biographies hold more interest for the English than for the American reader, one looks in vain for mention of two physician-writers who, born in the British Isles, are household names in the English-American reading world, namely W. Somerset Maugham and A. J. Cronin, and for the inclusion of Harvey Cushing among the sparse group of American medical men. In general, however, this book serves as a useful and readable source of concentrated information.

Of Little Patients. By Renée Zindwer. Boards. $1.95. No pagination, with illustrations. John Knox Press, Box 1176, Richmond 9, Virginia, 1952.

This book contains about two dozen vignettes of little patients the author has met in her medical practice. A hand drawing by the author of each child faces a short verbal sketch on the opposite page. She succeeds in capturing the individuality of personality and physical characteristics of the children in the drawings. The sketches, written with sympathetic and humorous insight, provide light, amusing reading. This excellent little book, handsomely bound and printed, is made to order for the physician's waiting room.

Medizinische Toxikologie: Lehrbuch für Ärzte, Apotheker und Chemiker. Von Prof. Dr. phil. et med. H. Fühner. Neu bearbeitet von Prof. Dr. phil., Dr. med. W. Wirth und Dr. med. G. Hecht, Third edition. Cloth. 21.60 marks. Pp. 251. Georg Thieme, Diemershaldenstrasse 47, (14a) Stuttgart O; agents for U. S. A., Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1951.

Although the basic structure of Fuhner's first edition has not been altered, considerable revision and additions have been made because of the introduction of many new toxic compounds and because much new material has been published regarding treatment. Material less important or obsolete has been eliminated, as are references, so that the size of the book has not been materially changed. The type is convenient for comfortable reading, and errors are remarkably few.

The text is divided into "General Toxicology," "Inorganic Poisons," and "Organic Poisons." General toxicology, concerning theories, classification, and basic treatment, is succinctly discussed, much as is found in other similar books. While inorganic poisons are grouped under the heading of each element, it is necessary to first consult the index, which is complete, to find where a particular poison may be discussed. Such is also true for the organic substances. While the authors have included many of the most recent drugs the list lacks an American flavor in that amobarbital and pentobarbital are not mentioned. The authors state that heroin is snuffed in America.

The function of the book is to acquaint physicians and medical students with substances toxic to man, and the authors have accomplished this end with conciseness and clarity. It is not nor was it intended to be encyclopedic. Diagnosis and treatment of intoxications are emphasized. Sectional headings are in bold type for ready reference. The book can be recommended to those who wish a quick reference regarding most of the common poisons.

A History of the Theories of Aether and Electricity: The Classical Theories. By Sir Edmund Whittaker, F.R.S. Cloth. $12. Pp. 434. Philosophical Library, Inc., 15 E. 40th St., New York 16; Thos. Nelson & Sons, Ltd., Parkside Works, Dalkeith Road, Edinburgh 9; 3 Henrietta St., London, W.C.2, 1951.

This is the first volume of a work discussing the changing concepts of a luminiferous ether and the efforts of physicists to develop mathematical descriptions of the electrical, magnetic, and gravitational tensions that pervade so-called empty space. As the author says, it seems absurd to apply the word "vacuum" to anything so rich and paradoxical in its properties as this medium through which material particles act on each other. If it were not for the peculiar properties of this ether, there would be no hope, for instance, of preventing the occasionally troublesome interference of television with diathermy. The first volume summarizes the pre-Einsteinian developments with the aid of partial differential equations and vector analysis. This will discourage the majority of medical readers, but it arouses curiosity, tinged with misgivings, as to the second volume, which will probably require non-Euclidean geometry and tensor calculus. It must, however, be commended as scholarly, accurate, and, in the nonmathematical passages, fascinating.

Ciba Foundation Conference on Isotopes in Biochemistry. Consulting editors: J. N. Davidson, M.D., D.Sc., F.R.S.E., and others. Editor for Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B. Cloth. $5. Pp. 288, with 79 illustrations. Blakiston Company (division of Doubleday & Company, Inc.), 1012 Walnut St., Philadelphia 5, 1951.

This small volume consists of 22 papers read at a symposium in London in March, 1951. Each paper concludes with a résumé of the discussion that followed its reading. The symposium was attended by 78 leading isotope experts, about half of them from Great Britain, with representation from other European countries, the United States, Canada, and South America.

The subject matter of the book is divided into six sections: (1) steroids, (2) hemoglobin and metabolic derivatives, (3) the use of tracers in the study of biologic effects of radiation, (4) nucleic acids, (5) proteins and amino acids, and (6) carbohydrate and fatty acid metabolism. These topics are reviewed in detail, the book being useful primarily to research workers in the isotope field or others contemplating the use of these techniques in their research. There is little to interest general practitioners, except those seeking an authoritative summary of actual biochemical investigations in sufficient detail to permit an evaluation of the usefulness of isotope techniques.

QUERIES AND MINOR NOTES

MEASLES VERSUS RUBELLA

To the Editor:—*Our city currently has a high incidence of both measles and rubella. I have never found the differential diagnosis so difficult as this year. Some children have a rash characteristic of measles yet show the swollen lymph nodes of rubella. Some children are only slightly sick and have a rash that looks like rubella, yet the lymph node enlargement is absent. The picture has probably been made more complicated by the frequent injections of gamma globulin. The differential diagnosis, of course, is of the greatest importance where a pregnant woman is involved. I will deeply appreciate an authoritative opinion. The supply of gamma globulin is too short to allow its use for diagnostic purposes.*

M.D., Massachusetts.

Answer.—The problem described is one that is being encountered frequently. Although enlarged postauricular glands are regarded as one of the diagnostic points in rubella, that sign is not always present; however, under such circumstances swelling and tenderness of postcervical glands can usually be detected. As a rule the character of the eruption will determine the diagnosis. The glandular involvement should serve as confirmatory evidence, although many children have one or more enlarged cervical lymph nodes under conditions that are otherwise normal. But, on account of the extensive use of gamma globulin, a measles rash may be so modified that a differential diagnosis is extremely perplexing. If there is a reliable past history of measles this disease should be excluded. If Koplick spots are found a diagnosis of measles is established. It is probable that the majority of the population who have lived in the city since infancy had measles before reaching adult age. In spite of the significance of rubella, one should not attribute to rubella every rash that appears on a pregnant woman.

PERIODIC EPILEPTIC SEIZURES

To the Editor:—*A 64-year-old white woman has had grand mal and, occasionally, petit mal epileptiform seizures for 43 years. Examination reveals no abnormal physical or laboratory findings. Her seizures began during her first pregnancy and have continued since then, occurring at monthly intervals at about the time her period would be due. On one occasion, she was free from attack for about three months. The attacks are always preceded by two days of hemoptysis. Menses started when she was 13 years old, and the menopause occurred at the age of 54. There has been no apparent change since the menopause. Diphenylhydantoin (dilantin®) sodium and phenobarbital sodium have controlled the severity of the seizures to some extent. I would appreciate suggestions.*

R. G. Hickerson, M.D., Galesburg, Ill.

Answer.—Periodicity characterizes the seizures of many epileptics, and, when this occurs in women, association with the menstrual period is common. In what way the premenstrual hormonal interplay acts to precipitate attacks has not been adequately studied. In this patient, the continuance of monthly seizures long after the menopause suggests that a natural periodicity was most influential; however the preictal days of hemoptysis are more unusual and difficult to explain. Additional details, such as the duration of this phenomenon, the volume of blood, and evidence of a pulmonary lesion, are desirable. Hormone therapy would seem useless at the patient's age. The dosage of drugs used is not mentioned. An increase in this, or the substitution of mesantoin® (3-methyl-5,5-phenylethylhydantoin) for diphenylhydantoin may be advisable.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

PROSTHETIC EARS

To the Editor:—*A 23-year-old man has, since babyhood, undergone about 14 operations for formation of an external ear, which was lacking at birth. At present, he has a large piece of tubular tissue transplant attached and growing about the ear canal. He has been seen by many plastic surgeons and it seems impossible to get any two who agree on what should be done. Are prosthetic ears satisfactory?*

Guy B. Griffin, M.D., Orange, N. J.

Answer.—It is clear that 14 plastic surgery procedures have created a scarred base. Further surgical procedures would thereby be jeopardized. A prosthetic ear, made of some acrylic base would now be appropriate. Latex rubber has also been employed, but it has generally been replaced by the newer materials. Materials can be applied by utilizing the remaining skin. No tissue should be sacrificed, in this instance, until the prosthetic technician is consulted. Such ears are artificial and must naturally be accepted as such. The ears may be made in colors that match the patient's skin. They are held in place by various gum mastic types of preparation.

DIAPHRAGMATIC HERNIA

To the Editor:—*A youth 16 years old was found to have a diaphragmatic hernia during a routine roentgen examination of school children. Apparently, he had no symptoms, but, since the examination, he complains of pain in the epigastrium at intervals. Should he be referred for surgery at once, or should he wait for more symptoms to occur? What are the usual symptoms?*

M.D., Mississippi.

Answer.—Asymptomatic diaphragmatic hernia in a 16-year-old boy is usually congenital in origin. In the absence of symptoms or evidence of complications, the problem should be considered one for elective surgery, which should be performed as soon as possible. To await the symptoms of complications may be unwise. With elective repair there is a low mortality rate and little morbidity; however, in the presence of complications such as strangulation of the herniated viscus, surgical treatment becomes serious. Likewise, there is evidence to suggest incomplete development of a collapsed lung when a large hernia is present from birth.

In the congenital hernia caused by absence of a portion of the diaphragm, symptoms are usually those of respiratory embarrassment, secondary to pulmonary compression or mediastinal deviation. Less commonly, the symptoms of intermittent bowel obstruction may occur, and, rarely, there may be actual strangulation of the colon or small bowel. There is no satisfactory therapy for a congenital lesion other than surgical correction.

DIABETES INSIPIDUS DURING PREGNANCY

To the Editor:—*A patient has had diabetes insipidus during three pregnancies, with complete relief of symptoms during the intervals between pregnancies. She is now early in her fourth pregnancy. I would appreciate any therapeutic suggestions.*

James T. Nix, M.D., New Orleans.

Answer.—Transient attacks of true diabetes insipidus are extremely rare, and it would be well to establish the diagnosis in this case, particularly since therapy involves the use of powerful uterine stimulants. One would expect the passage of large amounts of dilute (specific gravity 1.001 to 1.005) but otherwise normal urine, i. e., 8 to 12 liters in a 24 hour period, with corresponding thirst and resulting ingestion of unusual quantities of liquids. Evidence of consequent dehydration may be present.

It is believed that this disease is produced by a disturbance in the normal hypophyseal-hypothalamic relationship, resulting in a loss of vasopressin and oxytocin and a disappearance of the

normal antidiuretic action of the former, which controls tubular reabsorption of water in the kidney. The presence of antidiuretic hormone may be demonstrated by the injection of hypertonic sodium chloride during water diuresis (Hickey, R. C., and Hare, K.: Renal Excretion of Chloride and Water in Diabetes Insipidus, *J. Clin. Investigation* **23**:768, 1944). Inhibition of the diuresis indicates normal function; failure to inhibit is an indication of diabetes insipidus.

If the diagnosis has been substantiated and if the symptoms cause extreme inconvenience, loss of sleep, dehydration, and impairment of general health, specific therapy may be instituted. This consists of posterior pituitary (pituitrin®) administered either by subcutaneous injection or by the more convenient method of nasal insufflation of the powdered drug. Minimal initial doses should be used and gradually increased, commensurate with alleviation of symptoms, in an attempt to maintain normal physiological equilibrium and prevent overdosage. The danger of producing uterine irritability and/or contractions must be constantly considered and frequent observations should be made, with subsequent adjustment of dosage.

NUTRITIVE VALUE OF PROCESSED MEATS

To the Editor:—*What food elements are deficient in processed meats, such as "Spam," frankfurters, and scrapple, that can be found in fresh meats?*

Hugh W. S. Powers, M.D., Dallas, Texas.

Answer.—The nutrient losses in the three products mentioned, "Spam," frankfurters, and scrapple, are due chiefly to cooking losses, which occur both at home and in the food plant. According to Bowes and Church, the composition of scrapple, frankfurters, and luncheon meat, in terms of grams of each substance per 100 gm., is as follows:

	Scrapple	Frankfurters	Luncheon Meat
Protein	8.2	14.0	15.3
Fat	15.8	20.0	22.7
Carbohydrate	45.6	2.0	1.7
Calcium	0.007	0.006	0.02
Phosphorus	0.114	0.05	0.170
Iron	0.001	0.0012	0.0013
Vitamin A	175 IU	....	....
Vitamin B_1	.000146	.000160	.000367
Niacin	.0009	.0024	.0037

d-AMPHETAMINE SULFATE AND LIBIDO

To the Editor:—*I have noticed in treating obese patients for whom I prescribed d-amphetamine (dexedrine®) sulfate drugs, with or without mild sedatives, there is a diminution or loss of libido and potency. What can be done to prevent this? Libido and potency return on cessation of therapy.*

M.D., Pennsylvania.

Answer.—There is no evidence that *d*-amphetamine sulfate has significant alterative effect on the libido in normal persons. Even when administered over prolonged periods, *d*-amphetamine sulfate has no appreciable effect on the sexual function. Also, there have been no studies that substantiate the possibility that this preparation causes impotency. In special cases, where the libido is in a state of disequilibrium, an increase or decrease of libido is sometimes noted. Korns and Randall (*Ann. Int. Med.* **12**:253-255 [Aug.] 1938) report the case of a patient with orthostatic hypotension who complained of lack of libido. In this instance, a daily maintenance dose of amphetamine (benzedrine®) sulfate, taken for the hypotension, restored libido to normal. Shorvon (*Brit. J. Addict.* **44**:58-63 [July] 1947) noted that the administration of the amphetamines to aggressive psychopaths reduced libido and aggressiveness to normal.

The improvement of mood associated with *d*-amphetamine sulfate therapy and changes in the attitude of the patient toward his surroundings may lead the patient to attribute an increase or decrease in libido to this drug. There is no direct physiological action, and changes reported by normal patients must be regarded as subjective. A similar misinterpretation by the patient might occur with dexamyl,® a drug combining *d*-amphetamine sulfate with amobarbital (amytal®).

PROLAPSED INTERNAL HEMORRHOIDS

To the Editor:—*A woman, 51 years old, complains of mild depression, occasional dragging pains in right and left lower quadrants, and severe constipation with incomplete rectal emptying, even after use of laxatives. There is a sensation of spasm and, sometimes, severe pain high in the rectum. There is also pain radiating down the legs on straining and a degree of nervousness. Examination shows prolapsed internal hemorrhoids of fairly severe degree. Proctoscopic examination, aside from hemorrhoids, showed the rectum to be normal. Gastrointestinal series shows hypersecretion and hypermotility of the stomach, a small area of partial spasm high up in the small intestine, and slowing-up of barium in the large intestine. Is it likely that operation on the hemorrhoids will eliminate or help the high rectal discomfort? Will it have any effect on the gastric hypermotility and hypersecretion?*

M.D., New York.

Answer.—The only apparent organic finding in this patient is that of "fairly severe prolapsed internal hemorrhoids." Internal hemorrhoids of such severity as to prolapse tend to lessen the diameter of the anal passage. Because of this factor plus the pressure of venous engorgement and the sphincter ani spasm resulting from mucosal irritation, incomplete rectal emptying may result. At least, such a sensation is imparted to the patient. While "high rectal pain" is a term difficult to evaluate in the light of the visceral innervation of the bowel, in this instance, it is conceivable that such a symptom could be of a reflex nature. The following recommendations are therefore made: (1) skillful hemorrhoidectomy, (2) antispasmodic drug therapy for what appears to be an irritable colon, (3) bowel habit regulation, and (4) discontinuance of cathartics.

The hemorrhoidectomy will have no effect on the gastric hypermotility and hypersecretion. It may very well relieve what is described as "pain in legs while straining." (Thiele, G. H.: *J. A. M. A.* **109**:1271-1274 [Oct. 16] 1937.)

BRANCHIAL CLEFT FISTULAS

To the Editor:—*I have seen two children recently with branchial fistulas. One child, one year of age, has a tiny opening just above the medial end of the right clavicle, with a variable serous discharge, usually only a drop at the opening. In the second child, aged 4, the tiny opening is 1 in. above the right clavicle, and there is usually either a tiny crust at the opening or a tiny drop of pus present. In the first child, there is a definite small swelling on the posterior fauces on the same side at about its midpoint. In the second child, there is a similar but less obvious condition. What is your opinion in the management of these patients? Should they both be treated and, if so, at what age? Is it dangerous to leave these fistulas alone?*

M.D., Canada.

Answer.—The lesions described are probably branchial cleft fistulas. A more definite diagnosis could be determined by injecting the tracts with iodized oils (lipiodol®) or sodium iodide solution to give x-ray visualization of the tracts. If this does not give a definite diagnosis, other causes for chronic draining sinuses should be ruled out by smear, culture, and biopsy. Branchial fistulas usually cause no symptoms in early childhood. Surgical treatment is elective and can be postponed for several years. If recurrent severe infection occurs, the dissection becomes more difficult; however, in the hands of an experienced surgeon, this is not a dangerous operation.

EXTRASYSTOLES

To the Editor:—*Can you explain the occurrence of frequent extrasystoles following excessive ingestion of sodium bicarbonate? I know that the potassium ion depresses the myocardium and I wonder whether sodium acts in a contrary manner.*

M.D., New York.

Answer.—There is no indication that sodium salts, including both bicarbonate and chloride, are factors in the production of extrasystoles. It is possible, however, that the congestive failure induced by the free use of sodium salts in a patient with limited myocardial reserve may be accompanied by the appearance of extrasystoles.

METAL FUME FEVER

To the Editor:—*What is the cause and treatment of severe lumbar pain in a 41-year-old white man, occurring frequently following welding of galvanized or brass material? Urinalysis and hemogram are normal.*

Alan M. McKaig, M.D., Red Lake Falls, Minn.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—It is possible that this represents an atypical form of the acute clinical syndrome known as "metal fume fever," which is associated with the welding of zinc and also other metals. It is thought to be due to inhalation of finely divided particles of metal oxides produced during welding. This illness begins several hours after the exposure has ended and usually consists of general malaise, aching, chills, fever, and, frequently, respiratory symptoms, such as tightness of the chest and coughing. The temperature is usually not very high, 101 F or 102 F, and leukocytosis is common. The condition usually subsides within a few hours, and there are no residual symptoms in the case of zinc welding. If no fever, general symptoms, or leukocytosis are found during the attack, some other cause should be sought. If the materials being welded contain lead, a careful study of urinary lead excretion would be helpful. Orthopedic origin of the lumbar pain should be ruled out. The prevention of metal fume fever can be accomplished by carrying out the operation in a properly ventilated welding booth. Approved metal fume respirators will give some protection. The treatment is symptomatic.

Answer.—Any welding on surfaces previously galvanized is conducive to metal fume fever, which, in this instance, would constitute "zinc chills" or "zinc ague." In this condition, joint pains are not a prominent feature but could arise. Paroxysmal severe lumbar pain is not characteristic. The outstanding features are severe ague and malaise. From welding on brass objects, lead poisoning becomes a possibility due to lead being an impurity or additive. Joint pain could arise but perhaps never as the sole indication of lead poisoning. It is within reason to suspect that the mentioned severe lumbar pain derives from no chemical involved in the welding procedures. The best treatment for either the potential metal fume fever or lead poisoning resides in prevention of further exposure.

ADDICTION TO METHADONE

To the Editor:—*Is methadone hydrochloride as deleterious to the patient as morphine? Is it as difficult to break this addiction as that of morphine?*

M. O. Robertson, M.D., Bedford, Ind.

Answer.—It is assumed that this question is concerned with chronic intoxication (addiction) with methadone and not with the acute toxic effects of methadone. Experimentation with human volunteers has shown that methadone possesses addiction liability similar to that of morphine. In some respects, addiction to methadone is more deleterious than is addiction to morphine, since tolerance to methadone develops more slowly and is never as complete as is tolerance to morphine. For this reason, persons addicted to methadone tend to remain more sedate than patients addicted to morphine, with resultant greater impairment in their ability to carry out their usual activities. Furthermore, methadone, in the amounts used by addicts, is extremely irritating to the skin and causes marked inflammation and induration. Illness following withdrawal of methadone differs quantitatively from illness following withdrawal of morphine. It appears slowly, is never as intense as that following abstinence from morphine, and subsides slowly. Patients who have been addicted to methadone remain weak and easily fatigued for several weeks longer after withdrawal than do patients who have been addicted to morphine. For this reason, many addicts regard a methadone habit as being more difficult to "break" than a morphine habit.

Methadone will completely suppress the withdrawal symptoms in persons addicted to morphine. Because of this, the drug is widely abused by morphine addicts. When morphine addicts are attempting to obtain drugs from physicians, they may attempt to persuade the physician to prescribe methadone, stating that the drug is not an opiate but a synthetic and that it is not addicting. In support of the latter statement, they may refer to the fact that methadone withdrawal symptoms are never so severe as morphine withdrawal symptoms, not mentioning that symptoms of withdrawal from methadone are prolonged. Many addicts state that it is easier to obtain prescriptions for methadone from physicians than it is to obtain prescriptions for morphine. All physicians should, therefore, be aware of the addicting properties of methadone and should be as careful in prescribing it as they are in prescribing morphine.

HORMONES AND SEX DETERMINATION

To the Editor:—*1. Does the female normally produce male hormone? 2. Is there any time in the formation and growth of the embryo that the sex can be changed by mechanical or chemical stimulation?*

M.D., New York.

Answer.—Androgen is produced in the female by the adrenal cortex and in the male by the adrenal cortex and the interstitial cells of the testis. Androgen production is always greater in the normal male than in the normal female because of its dual origin. Excessive production of androgen in the female may occur as the result of the development of tumors or hyperplasia of the androgen producing cells. Pseudohermaphrodism may develop as a result of excessive production of androgen by the adrenals in the female early in embryonic life, but complete reversal of sex cannot be produced in this manner.

OBSTETRIC ANESTHESIA

To the Editor:—*In obstetric patients is there more immediate postpartum bleeding when the patient has enough ether to produce surgical anesthesia?*

M.D., Pennsylvania.

Answer.—Ether in a deep surgical plane of anesthesia produces relaxation of the uterine musculature. Control of postpartum bleeding depends on the contractibility and retractibility of the uterine musculature. Therefore any paralysis of the uterine musculature produced by an anesthetic agent will predispose to increased postpartum bleeding. The depth of anesthesia and the rapidity with which light planes can be obtained in order to permit recovery of the uterine musculature are very important. Also the duration of anesthesia will play a factor; the longer the anesthesia the more the bleeding.

CONGENITAL DEFECTS

To the Editor:—*I disagree with the answer given to the question concerning congenital defects in* The Journal (**148**:*689 [Feb. 23] 1952). The statement is made that "a mother with one congenitally defective baby is no more likely to have a repetition than is the average patient. A mother with two defective babies is more likely to have a repetition. A woman with three defective babies is likely to have defective babies rather consistently." This answer is vague and incorrect. The birth of a malformed infant automatically increases a woman's risk in subsequent pregnancies from roughly 1 in 75 (usual incidence of malformation among all infants) to somewhere between 1 in 10 and 1 in 35 (Murphy, Record, and McKeown). Murphy's limited data on such cases suggest that the figure for women with two abnormal infants is probably 1 in 5 or 1 in 10. There are no suitable data available for women with three abnormal children, but it is logical to assume that the risk figure is about one in four. These figures relate to major malformations (where incidence is 1 in 100 or slightly less), mainly of the central nervous system. It is better to give the risk figure for specific defects if possible. The more that is known about the pregnancy and the type of malformed infant that the woman has, the more specific can one be in formulating a risk figure for her.*

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